Psychotic-like experiences and hypomania in the perinatal period

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Content

Lay Summary

Systematic Review

Psychosis is a condition which involves a loss of contact with reality and can feature hallucinations and delusions. Hallucinations are a sensory experience that is not based in reality; hence, in the case of visual hallucinations people see something that is not really there. We do have limited knowledge about visual hallucinations as they have been the subject of little research. We believe that they have been overlooked by researchers, as they assumed that visual hallucinations were very rare. However, we now know that almost half of people with psychosis experience visual hallucinations and when they do, they tend to present with more severe mental health difficulties and feel very distressed. Hence, we concluded that it would be very important to increase our understanding of them and learn how people experience them as well as how they impact on their lives and well-being. With the aim to gather and summarise all relevant research, this is called a systematic review, we searched three databases containing articles written by psychological and psychiatric researchers to find relevant studies that have looked at visual hallucinations in psychosis. We were interested in finding out more about these aspects of visual hallucinations:

- How often and when do they occur?
- How long do they last?
- What do they look like (colour, size, shape, etc.)?
- Where are they (e.g. nearby or further away)?
- What is their content?
- Do visual hallucinations occur in combination with other types of hallucinations? For instance, do they speak?
- How do visual hallucinations impact on people's life?
    - What do people think about them?

- Do they cause particular feelings such as fear?
- Do people respond to visual hallucinations in a particular way?

We found 14 relevant studies in order to answer the above questions. Some of them asked numerous participants to complete questionnaires or to respond to interview questions about visual hallucinations, while other much smaller studies investigated the subjective experiences of just one or a few participants in detail.

Analysing the findings of all included studies, we found that visual hallucinations can take on many forms and vary between people when looking at frequency, length and appearance (i.e. what they look like). Additionally, there was some variety in content which included geometric patterns, light flashes and whole scenes, however, most commonly people saw human figures. Most visual hallucinations (but not all) were linked to other types of hallucinations, such as hearing voices. Most people believed their visual hallucinations to have a negative meaning or to be a threat to themselves and found them very distressing. This led them to engage in certain behaviours in order to protect themselves, such as running away or hitting the hallucination. We know that this cycle of fear and protective behaviours can make things worse (e.g. people cannot learn that their hallucination cannot hurt them), so this is important information when designing psychological therapy.

We recommended further research to learn about links between different aspects of visual hallucinations such as content, frequency and distress and to explore whether and how they change over time.

Empirical Study

In addition we developed a research study with the aim to further understand Postpartum Psychosis, a severe mental health disorder that can affect women after the birth of their child. There are a range of symptoms women can experience, but most commonly they are very elated or 'high', confused and excessively irritable while also having delusions,

which are beliefs that could not be true and the majority of people would think of as strange (for example, thinking that the TV has a special message for you), and / or hallucinations. As it is difficult to recruit large numbers of women experiencing Postpartum Psychosis (it occurs after one to two in 1,000 births) to participate in research, we decided to investigate so called 'psychotic-like experiences' of pregnant women and new mothers. Psychotic-like experiences consist of both hallucinations and delusions and are thought to be common in the general population. Researchers have found that many people who do not require support from mental health services hear, see or even smell things that are not really present and believe things that others would consider bizarre or untrue. Psychological theories suggest that people's interpretations of psychotic-like experiences, rather than the experiences themselves, play a significant role in causing distress. For instance, researchers found that fear is not directly generated by hearing a voice, but by what one thinks about this voice. When people interpret a voice or a belief as threatening or as an indication that they are "crazy", they end up feeling more anxious or low than those who think about a voice as a normal experience that can happen to anyone. We wanted to determine whether this link between people's interpretations of delusions/hallucinations and mental health difficulties, which has been researched in people with psychotic illness, is also relevant for women experiencing Postpartum Psychosis. We felt learning more about such a potential link could be helpful in order to identify women at risk of Postpartum Psychosis before it occurs and in order to develop and offer psychological therapies which help them to think about and positively change their interpretations of psychotic-like experiences. At the moment, we do not know much about what types of psychological therapy may be particularly helpful for women with Postpartum Psychosis.

Additionally, we believe that Postpartum Psychosis and Bipolar Disorder, a mental health disorder that is mainly defined by phases of depression and feelings of elation, known

as mania, are related, as women are more likely to experience Postpartum Psychosis if they have a previous diagnosis of Bipolar Disorder or have a close relative with Bipolar Disorder. That being the case we further wanted to find out if experiencing mania and psychotic-like experiences are related for pregnant women and new mothers.

We recruited 403 pregnant women and new mothers who filled in an online survey answering questions on psychotic-like experiences, mania, the way they interpreted events and moods and their emotions. We then analysed their responses and did not find any connections between mania and psychotic-like experiences. Surprisingly, the above described theory that distress is caused by interpretations of a psychotic-like experience could not be confirmed either. We think that this may show that psychotic-like experiences, distress and mania occur independently from each other or if connected, they are not linked through interpretations, but through other mechanisms that we have not yet uncovered.

Phenomenology and Impact of Visual Hallucinations in Non-Affective Psychosis: A Systematic Review

Abstract

Visual hallucinations (VH) are a common experience in psychosis, but are largely neglected in research. The aim of the present systematic review was to synthesise the literature on the phenomenology and impact of VH in non-affective psychosis in order to increase understanding of the subjective experience of VH. Systematic searches of the databases PsycInfo, PubMed (Medline) and Scopus were conducted using the keywords psychotic OR psychosis OR schizo* AND hallucinat* AND visual OR vision. Studies covering any aspect of phenomenology and impact on individuals with diagnoses of schizophrenia spectrum disorders between the ages of 18 and 65 were included, regardless of design or research question. A total of 14 studies met inclusion criteria. While the overall quality of studies was deemed acceptable, the standard of evidence remains low, with seven studies being case reports or single-case design studies.

The review indicated that VH differ markedly between individuals with much variation in frequency and length. While there were also differences in location, appearance and content of VH, patterns emerged showing that the majority of people see human figures, which were nearby and comparable to veridical perceptions. VH mostly occurred in combination with hallucinations in other sensory modalities.

Most participants were negatively impacted by their VH. Appraisals of malevolence and personal significance of VH were prevalent. However, a more mixed picture arose when looking at behavioural responses with some participants using coping strategies, while others appeared to not react.

Due to its limitations, the data reviewed neither allowed for firm conclusions to be drawn about prevalence of phenomenological characteristics nor for links to be established

between impact and particular characteristics of VH. However the review highlighted phenomenological diversity, leading to recommendations that clinicians offer personalised treatment. The review also stressed commonalities and their importance for theoretical models of VH, such as multimodality. Priorities for future research include clarifying the nature of the relationship between specific phenomenological aspects and impact on individuals experiencing VH.

Introduction

Hallucinations are defined as a "sensory experience which occurs in the absence of corresponding external stimulation of the relevant sensory organ, has a sufficient sense of reality to resemble a veridical perception, over which the subject does not feel they have direct and voluntary control, and which occurs in the awake state" (David, 2004, p. 200). They are considered a primary symptom of psychotic disorders, for example schizophrenia, by the 10th edition of the International Classification of Diseases (ICD-10, World Health Organisation (WHO), 1992) and the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association (APA), 2013), and have traditionally been categorised by the sensory modality (i.e. visual, auditory, olfactory, gustatory, tactile or somatic) in which they occur (Aleman & Larøi, 2008). The exploration of visual hallucinations (VH) has been largely neglected. Little is known about how they are experienced by people with non-affective psychosis, which is why this review aimed to increase understanding of the phenomenology and impact of VH in this particular group. The term “phenomenology” will be understood in a pragmatic way referring to a detailed description of clinical features of VH (Larøi, 2006). “Impact” will be understood as ramifications of VH in terms of how they are thought about, felt about and responded to. The overall aim is to systematically analyse and summarise the subjective experience of VH (Todres, 2007).

Visual Hallucinations

VH present in a range of psychiatric and organic conditions, but can also occur in the non-clinical population (Waters et al., 2014). Organic conditions of note are ophthalmologic disorders (eye diseases) and neurologic disorders (epilepsy, migraine, Parkinson’s disease, neurodegenerative diseases, etc.) (Bernardin et al., 2017). In psychiatric populations, hallucinations are most commonly associated with psychosis spectrum disorders such as

schizophrenia and schizoaffective disorders; however, they also present in affective disorders such as major depressive and bipolar disorder, post-traumatic stress disorder (PTSD) as well as personality and eating disorders including anorexia and bulimia nervosa (Waters & Fernyhough, 2017).

Further, VH are experienced by the general population. Based on a review of six studies, Waters et al. (2014) estimate the weighted mean to be at 6% when excluding VH arising from physical illness or the consumption of drugs. Recent research shows that VH in non-affective psychosis vary in complexity, are accompanied by mixed insight and low perceived controllability. However, in contrast to clinical research participants, VH in the non-clinical population are not significantly linked to emotional distress or negative impact on functioning, even though a third of non-clinical participants endorsed visions that were of a negative nature (Toh et al., 2020).

Such research suggests that VH, as with other psychotic phenomena, exist on a spectrum within the general population, from no psychotic experiences through to clinical levels of psychosis (i.e. a requirement for care) (Johns & van Os, 2001). Empirical findings (e.g. Gawęda, Prochwicz, & Cella, 2015) support this account, showing that psychotic like experiences (PLEs) are both frequent (7.2 % in the general population (Linscott & van Os, 2013)) and linked to an increased risk of psychosis (Kaymaz et al., 2012). Whilst such conceptualisations relate to PLEs, including hallucinations in different modalities and delusions, rather than VH specifically, their relevance may be inferred based on recent evidence (discussed above) linking distress to VH in people with diagnosable psychotic illness only (Toh et al., 2020).

Visual Hallucinations in Psychosis

While increased research has progressed the understanding of auditory hallucinations (AH) in recent decades, non-auditory modalities, such as VH, have been

largely neglected in both empirical research and clinical practice (Fernyhough, 2019; Waters et al., 2014). This emphasis may be explained by AH being a cardinal symptom of psychosis with an estimated prevalence of 70%. However, recent data challenges the assumption that VH are an atypical symptom showing that many of those experiencing psychosis experience them and it has been shown that VH are associated with poorer prognosis (Clark et al., 2017; McCabe et al., 1972) and increased psychopathology (Mueser et al., 1990). For example, van Ommen et al. (2016) found that present state prevalence of VH in non-affective psychosis was as high as 18.9%, with a lifetime prevalence to be shown as high as 47.5% in schizoaffective disorders and 37% in schizophrenia. They tend to co-occur with hallucinations in other modalities, most frequently AH (Frieske & Wilson, 1966; van Ommen et al., 2016). For example, Goodwin and Rosenthal (1971) found that patients with VH presented with a higher than average prevalence of AH of 81.3%. Fused hallucinations that present in two modalities simultaneously may also be present, however they are thought to be an infrequent occurrence (Goodwin & Rosenthal, 1971) and to be usually unrelated (Deahl, 1987). Hence, separate and detailed exploration of VH should be considered a worthwhile undertaking with the potential to inform clinical practice and theoretical accounts applicable to a wide range of people receiving mental health care.

VH in psychosis tend to be a complex experience and commonly consist of human figures, faces, animals or objects. Their contents vary, but are frequently of cultural relevance, for instance, resembling religious figures (Gecici et al., 2010). It has been reported that the perceptual quality of VH is such that it is close to real perceptions, for example, being incorporated into the general visual scene and appearing to be three-dimensional (Phillipson & Harris, 1985).

Typically, appraisals of VH within populations with psychosis are negative and found to be distressing and threatening to one's mental health (Dudley et al., 2012). In their

cognitive model of VH, Collerton and Dudley (2004) theorise that a person appraises VH as a threat to their physical or psychological wellbeing which leads to fear and anxiety, in turn causing the use of safety behaviours (e.g. avoidance or escape) to prevent feared outcomes. Behavioural responses thereby inadvertently maintain appraisals and distress, as a person cannot learn that they are actually safe. While some empirical support for the model was found, it remains unclear how VH impact the majority of patients with non-affective psychosis and what kind of appraisals, emotions and behavioural responses are linked to VH. It was hoped that links between specific phenomenological characteristics of VH and potential impact, such as type and/or level of distress, could be explored in this review. However, when developing a protocol and conducting preliminary searches (see Method section) it became apparent that such relationships have not yet been investigated. Hence, this review will provide a general overview of impact of VH.

Over the last decade, vulnerability studies have gradually concentrated on exploring the emergence of individual symptoms rather than diagnoses and it has been found that psychotic symptoms have specific individual correlates suggesting that there may also be a unique set of risk factors for VH. Using a multi-factorial model, Goldstone et al. (2012) were not able to identify a specific genetic predisposition to hallucinations including VH, however, other vulnerability factors such as trauma, in particular sexual and physical abuse during childhood, as well as negative automatic thoughts, and a tendency to suppress unwanted experiences predicted hallucinations in psychosis. The study demonstrated that the risk was highest when two or more risk factors interacted with each other, highlighting that vulnerability can develop over time (Goldstone et al., 2012).

Looking at VH specifically, it was found that childhood experiences of neglect, molestation and rape were significantly associated with VH: the more of these experiences a person has had, the higher the likelihood of experiencing VH (Shevlin et al., 2007). Further,

experiencing racial discrimination, specifically police abuse, denial of a promotion or discouragement from pursuing education, was found to be associated with a higher risk for lifetime VH (Oh et al., 2016).

There are few previous reviews that have investigated VH in psychosis.

First, Aynsworth et al. (2017) systematically reviewed the appropriateness of existing measures for assessing VH in psychosis. For this purpose they compared nineteen measures aiming to assess VH using an adapted quality assessment tool. These measures were designed for general hallucinations, general psychosis symptoms and VH specifically. They concluded that most measures were inadequate, stating aims in vague terms without giving details on purpose (e.g. focus on interventions, exploration of prevalence) or, with one exception, not providing a definition of VH. They suggested that future measures consider an extended range of item content such as history and progression of VH, content, controllability, beliefs and responses to VH in order to improve on an exploration of phenomenology and the development of psychological treatments. In aiming to gain an improved understanding of peoples' experiences this review will contribute to the formalisation of a detailed definition, which is important to the development of effective treatments.

Second, Waters et al. (2014) presented a cross-disciplinary and cross-diagnostic examination of VH reviewing evidence on prevalence, clinical characteristics, phenomenology, and assessment methods for VH in the psychosis spectrum, alongside research on brain imaging, cognition, electrophysiology, and treatment. However, they did not offer any information on methods employed for their search, eligibility criteria, evaluation of studies included and, in case of phenomenological explorations, they only provided a brief overview and did not clearly link their descriptions to the evidence quoted. Therefore, while the review provides a first examination of VH in psychosis, it cannot be

concluded that it delivers a methodically sound and comprehensive investigation of all available evidence specific to differing populations (i.e. people with non-affective psychosis).

Aims of this Review

As described above, visual hallucinations in psychosis are common, complex and vivid phenomena, however their experiential nature and impact has rarely been explored in the scientific literature and investigations of the core features of VH remain underrepresented. This gap in our understanding is surprising, as considering the phenomenology of hallucinations and their impact has significant implications for both clinical practice and theory. Potential implications will be briefly introduced now and discussed again later taking into account the results of the review.

Theory. A deepened understanding of the phenomenology of VH may allow a refinement of existing models of VH as well as enable the derivation of new theories which fit the intricacy of lived experience, instead of reducing VH to clinical phenomena viewed as a single prefabricated concept.

Cognitive theories have considered hallucinations as internal events misattributed to external stimuli. However, this account of an externalising bias does not take into consideration the phenomenological diversity of hallucinations (Larøi, 2006) and experiments to study misattribution of internal events to external sources in the formation of hallucinations are far removed from the subjective experiences described (Beck & Rector, 2003).

Further, exploring if VH characteristics are conveyed along dimensions, an assumption consistent with the theoretical accounts of VH lying on a continuum, will give some preliminary insight into the relationship between VH phenomenology and impact.

Clinical Practice. Widening phenomenological understanding will enable clinicians to provide patients with information about VH, thereby normalising the experience and

offering a basis from which to discuss personal experience. Further, authors of studies using measures designed to gather information about hallucinations have remarked on the positive effect this has had on communication and therapeutic alliance (Chadwick & Birchwood, 1994; Stephane et al., 2003).

Individualised psychological treatment and management should take phenomenological features into account, moving away from treatment approaches designed for a particular diagnosis towards targeting specific symptoms, manifestations of underlying processes and personal experience (Tarrier et al., 2001). Cognitive behavioural therapy for psychosis (CBTp) is the recommended treatment for psychotic symptoms by the National Institute for Health and Care Excellence (NICE, 2014) and has an established evidence base for the treatment of non-specified hallucinations with small to medium effect sizes (for a meta-analytic review see Sitko et al., 2020). However, research for the specific treatment of VH has not gone beyond case series.

Considering the phenomenological nature of an individual's VH may also help with tracking progress throughout a course of treatment. Research suggests that qualitative change that manifests itself in decreased intensity, frequency and/or emotional impact signifies effective treatment (Larkin, 1979; Miller, 1996). Therapeutic interventions should target phenomenological aspects of VH, which therefore merit detailed assessment when evaluating treatment efficacy. Hence, outcome criteria which only consider the presence/absence of VH are likely to miss mechanisms of change and crucial changes in themselves.

A more detailed understanding of the phenomenology of VH can aide the development of assessment tools, some of which already exist (for a review see Aynsworth et al. 2017), and their use, in turn, can contribute to further improved phenomenological understanding and specific psychological treatment of VH. For example, clinicians may be

able to develop more individualised formulations (Aynsworth et al., 2017) and the effectiveness of treatments such as CBTp can be observed and measured along a number of phenomenological characteristics based on evidence rather than along parameters, which, as some argue, are arbitrarily chosen (Lowe, 1973), and not based on a comprehensive understanding of the subjective experience of VH (Larøi, 2006).

Method

The systematic review of the literature on phenomenology and impact of VH in non-affective psychosis was conducted following the 'PRISMA' (preferred reporting items for systematic reviews and meta-analysis) guidelines (Moher et al., 2009). A protocol based on PRISMA for systematic review protocols (PRISMA-P) guidelines was developed a priori and served as a road map for the review detailing objectives and methods as described below (Moher et al., 2015).

Eligibility Criteria

Peer-reviewed studies of any design assessing phenomenological aspects and impact of VH within a sample of participants with a primary diagnosis of non-affective psychosis were included. Non-affective psychosis is reported as the diagnostic category schizophrenia spectrum disorders in the DSM-5 (APA, 2013) and included schizophrenia, schizophreniform disorder, brief psychotic disorder, delusional disorder, schizoaffective disorder, and psychotic disorder not otherwise specified. Studies that explored phenomenological characteristics and impact of VH were reviewed (see details below). No restrictions regarding co-morbidities or participants' characteristics such as gender, ethnicity or location were applied.

Studies were excluded if they concerned hallucinations in non-visual modalities or assessed VH occurring in the context of mental health difficulties other than non-affective psychosis such as PTSD and bipolar disorder or medical presentations such as epilepsy, eye

disease or neurodegenerative disorders. As young and old age can impact on both diagnosis and experience of VH (e.g. VH are very common in dementia (Teeple et al., 2009)), studies with research participants under the age of 18 and over the age of 65, were also omitted. Additionally, studies eliciting (e.g. through hypnosis) hallucinations, investigating drug-induced hallucinations or assessing hallucination-proneness only (e.g. Launay-Slade Hallucination Scale (LSHS; Launay & Slade, 1981)) were excluded. Studies merely reporting on the content of VH, usually as a secondary description to a research question with a different focus, but not on further characteristics, were also omitted.

Information Sources and Search

The electronic databases PsycInfo, PubMed (Medline) and Scopus were searched as they were considered to provide a full breadth of worldwide research in psychology, psychiatry and related academic disciplines. Pre-specified search criteria without stating a start date up to and including September 2020 were used. Search terms were psychotic OR psychosis OR schizo* AND hallucinat* AND visual OR vision. The limits 'published in English language' and 'peer-reviewed articles' were applied to the searches. Further, both reference lists of articles determined to meet inclusion criteria and existing reviews relating to VH within the context of non-affective psychosis were screened (i.e. Aynsworth et al., 2017; Steel, 2015; Waters et al., 2014). All identified texts could be obtained electronically.

Selection

Following the removal of duplicates, titles and abstracts were screened for relevance. Articles considered relevant were retrieved in full text and eligibility was assessed. Texts determined to be eligible were further screened by a second rater, also a Trainee Clinical Psychologist. Where there was disagreement over whether an article met eligibility criteria, the raters discussed the article in depth until an agreement was reached. Discussion arose for a total of four articles and reasons for disagreement were the

employment of diagnostic tools no longer in use and reporting of findings where it was unclear if it related to VH specifically or hallucinations in general. For instance, the author of this review initially included a paper (Goodwin & Rosenthal, 1971) which reported on hallucinations in different modalities being of the opinion that data could be extracted for VH only, however, the second rater argued that it was not possible for the reader to clearly distinguish between hallucinatory modalities reported on ,meaning that assumptions would have to be made. Hence, the article was excluded. In general, reasons to omit articles included: research participants did not have a diagnosis of schizophrenia spectrum disorders and/or did not experience VH; data were not provided separately for participants with a diagnosis of schizophrenia spectrum disorders and/or VH; the research focused on participants over the age of 65.

Data Collection and Items

Demographic and methodological features collected from eligible studies included the following: country where the study was conducted; study design; number of participants diagnosed with non-affective psychosis and experiencing VH; mean age of relevant participants; percentage of male participants; diagnostic tools; and measures assessing VH. Phenomenological aspects of VH recorded included key findings on temporal aspects such as frequency and duration, perceptual qualities such as appearance and location, content of VH and combination with other modalities. Identification and development of these categories were guided by the previsously introduced pragmatic definition of phenomenology reporting on any available description of clinical features of VH (Larøi, 2006), previous reviews exploring phenomenology of psychotic symptoms other than VH (e.g. Baumeister et al., 2017) and positively appraised measures of VH phenomenology such as the North-East Visual Hallucinations Interview (NEVHI; Mosimann et al., 2008;) as reviewed by Aynsworth et al (2017). Recorded key findings on impact were based on the premises of the Cognitive

Model of VH (Collerton & Dudley, 2004) and comprised of sense of control and appraisals, emotional experience and behavioural responses. Links between key features of phenomenology and impact could not be examined due to a lack of available research dictating that findings on phenomenology and impact will be reported in turn.

Quality Appraisal

The quality of each study was appraised using assessment tools suitable for respective study design. For this review, utilising specific critical appraisal tools was considered preferable over utilising one general tool representing all study designs (e.g. Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018), as it was thought to generate a more detailed, reproducible and transparent quality appraisal process in a review including studies published across several decades and countries and using varying designs.

Cross-sectional studies were assessed employing quality indicators derived from the AXIS tool (Downes et al., 2016) which was chosen as it specifically addresses study design quality and risk of bias and is accompanied by an extensive explanatory document (Downes et al., 2016). For the appraisal of case studies and case series the Joanna Briggs Institute (JBI) critical appraisal checklist for case reports was applied (Moola et al., 2017), and for studies utilising a single-case design, items were taken from the Single-Case Reporting Guideline In Behavioural Interventions (SCRIBE) 2016 Checklist (Tate et al., 2016), as these were the only specific tools to critically evaluate studies using these particular designs (Ma et al., 2020).

The chosen tools are comprised of between eight and 26 questions, which evaluate papers aiming to determine how generalisable and valid their results are by assessing the detail provided on a study's aims, methods, analyses and interpretation of results. To calculate a comparable total quality rating, a score of up to three points was awarded per question, with one point representing weak quality, two points representing moderate and three points representing strong quality. As the tools varied in the number of questions, not

all of which were applicable to every study, an overall percentage score was calculated with a higher percentage indicating higher overall quality (Harrison et al., 2017). The overall quality rating of studies is provided in Table 1. Details of quality appraisal tools and individual item scores, allowing the reader to learn about strengths and weaknesses of individual articles beyond the overall outcome score, are shown in Appendix A.

Twenty-five percent (n = 4) of included studies were randomly selected to be second-rated by a rater blind to the outcome of the first quality appraisal. At least one paper representing each study design was chosen by drawing lots. The interclass correlation, a measure of inter-rater reliability, was .84, indicative of good reliability.

Risk of Bias in Individual Studies

The risk of bias was evaluated by considering how methodology might impact on study results. Factors considered were recruitment strategies as well as choice and administration of measures. For details see Appendix A.

Synthesis of Results

Given the heterogeneity of research on phenomenology and impact of visual hallucinations in psychotic disorders, studies were divided into themes to synthesise results following quality appraisal. When applicable, only relevant subsets of data were extracted. For example, some papers compared VH between groups, some of which had characteristics listed as exclusion criteria, thereby also reporting on the experiences of participants with illnesses such as eye disease. In this instance, only data for the group of participants with psychotic disorders was included as part of this review. Other studies had primary foci different from phenomenology such as fMRI data during the experience of VH. Here, again, only relevant data for the phenomenology and impact of VH was extracted.

Results

The following section will describe study selection, provide an overview of study characteristics and then synthesise the results on phenomenology and impact of VH in non-affective psychosis.

Study Selection

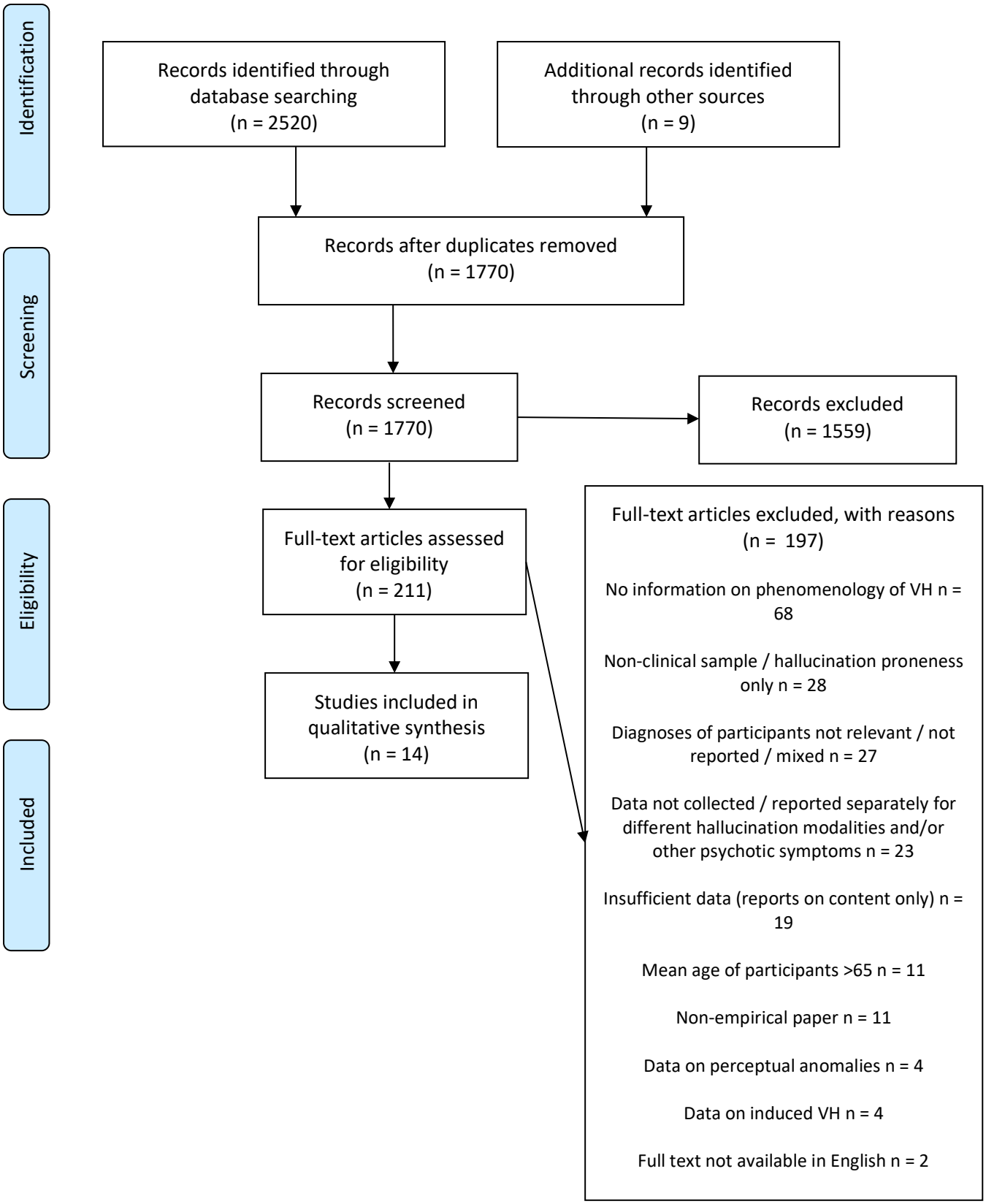
A total of 14 studies fulfilled inclusion criteria for this review. The selection process is presented in Figure 1, including reasons for exclusion at the stage of full-text screening.

Overview of Reviewed Studies

Table 1 provides an overview of the characteristics of each study, presented in alphabetical order by surname of the authors. Relevant research was published between 1966 and 2019. Four studies were conducted in the United States of America (USA), two in The Netherlands and the United Kingdom (UK), one in Finland, Germany, India, Saudi Arabia and Sweden. One study reported on a sample recruited in both The Netherlands and the Dutch speaking region of Belgium. The included number of participants with diagnoses of schizophrenia spectrum disorders experiencing VH ranged from one to 57 (median = 10, IQR = 1-44; total n = 298). Participants in eight studies were recruited from mental health services such as psychiatric hospitals or community services for people with psychosis. In one study participants were recruited in a specialist research unit. In one study the author reported having been approached by the participant who had read his earlier work.

Figure 1

PRISMA Flow-Chart for Study Selection



on the experiences of voice hearers. In four studies recruitment settings were not described.

The tools used to establish diagnoses of non-affective psychosis, and the subtype of diagnosis referred to, varied across studies. Eight studies described using diagnostic criteria outlined in the DSM or International Classification of Diseases (ICD). One study used criteria set by the National Institute of Mental Health (NIMH), a component of the US Department of Health and Human Services. One case study described clinical examination based on the Positive and Negative Syndrome Scale (PANSS), a medical scale used for measuring symptom severity in schizophrenia spectrum disorders (Kay et al., 1987). One cross-sectional study based a diagnosis of schizophrenia on a method outlined by Mayer-Gross, Slater and Roth (1969) and a minimum of two or more symptoms suggested by Parkes (1963) indicating a diagnosis of schizophrenia. Three studies did not state how non-affective psychosis was diagnosed, however, as two are case reports and one is a single case study it is likely that diagnoses were based on some form of clinical assessment rather than on self-report.

The sex ratio of participants also differed by study. Two studies, both case reports, included only male participants, and two studies, one case report and one study employing a single case design, included only female participants. One study did not report the sex ratio of participants with non-affective psychosis. The remaining samples presented with a sex ratio ranging from 30 to 81 percent male (median = 66, IQR = 44-74.5).

Eight studies reported on medication use: one case study's participant did not use any psychiatric medication, one study reported that participants experienced VH both when using medication and when not using it for a period of six weeks, six studies stated that participants used a range of antipsychotic medication. Six studies did not include information about participants' use of psychiatric medication.

Seven studies were of cross-sectional design, three of which were analytical with comparison groups and four of which were descriptive without comparison groups. Four

Table 1

Demographic and Methodological Features of Included Studies with Quality Scores

Author, Year & Country	Design	N	Mean Age (SD)	% Male	Group	Psychotic Disorder Diagnostic Tool	Visual Hallucinations Measure	Quality Score
Bracha et al. (1985), USA	Cross sectional with comparison group	44	30 (8)	66	Chronic schizophrenia	DSM III criteria	Sheet of paper depicting a person to make a mark where their typical VH occurred	80%
Chiu et al. (1988), Finland	Single case, multiple baseline with intervention	1	34	0	Schizophrenia	Not reported	Worksheet to be taking with her marking start and end of VH episode; Asked to draw VH	75%
Delespaul et al. (2002), The Netherlands	Cross sectional with comparison group	57	Not reported	Not reported	Schizophrenia spectrum disorders	DSM IV criteria, diagnosis given by clinician; accuracy checked independently using case-note material and the OPCRIT	ESM (period of 1 week) collecting reports of hallucinations, thoughts, mood, current activity, social circumstances and place	82%
Frieske & Wilson (1966), USA	Cross sectional with comparison groups	50	38.4	72	Schizophrenia	DSM criteria	Interview enquiring about VH specifically (clear description provided)	81%
Grover et al. (2012), India	Case study	1	45	0	Paranoid schizophrenia	PANSS	Not reported	93%
Hoffman & Varanko (2006), USA	Case study	3	Not reported	67	Schizophrenia & Schizoaffective disorder	Not reported	Not reported	73%

Karlsson (2006), Sweden	Case study	1	Mid-40s	100	Schizophrenia	Not reported	Narrative analysis of autobiographical document	93%
Oertel et al. (2007), Germany	Case study (fMRI)	1	27	100	Paranoid schizophrenia	DSM-IV Criteria	Quality and content recorded by verbal report and a brief interview based on Aggernea's criteria (1972). Drawings of VH	93%
Oorschot et al. (2012), Netherlands & Belgium	Cross sectional	48	32.8 (10)	77	Schizophrenia spectrum disorders	DSM-III-R and DSM-IV Criteria, using OCCPI or CASH	ESM on 6 consecutive days at ten randomly selected time points a day, collecting reports of emotions, psychopathology and context	93%
Small et al. (1966), USA	Cross sectional	15	35 (range 19 – 48)	30	Acute schizophrenic episode	NIM Criteria	Questionnaire including 100 questions about hallucinations (of all modalities)	68%
Thomson et al. (2017), UK	Single case, multiple baseline	5	Betwe en 18 and 30	40	Psychotic disorder unspecified (n=1), Paranoid schizophrenia (n=4)	DSM-IV; SCID-I	NEVHI: Adapted PSYRATS; Individual daily diary ratings	100%
Van Ommen et al. (2019), The Netherlands	Cross sectional	27	36.6 (9.5)	56	Schizophrenia (*n*=32), Schizoaffective disorder (n=9), Psychotic disorder NOS (n=3) and schizophreniform disorder (n=1) (this data refers to complete sample, data for VH group	DSM-IV-TR	VHQ	88%

					not separately provided)			
Wilson et al. (2016), UK	Single case, multiple baseline with intervention	2	18 – 25	50	Schizophrenia undifferentiated type	DSM-IV, SCID-I	NEVHI; Adapted PSYRATS; ARVHI	89%
Zarroug (1975), Saudi Arabia	Cross sectional	43	Under 40	81	Schizophrenia	Clinical examination following the method outlined by Mayer-Gross, Slater and Roth (1969). Two or more of the symptoms suggested by Parkes (1963) as strongly supporting a diagnosis of probable schizophrenia.	Described and then explored using parameters suggested by Lowe (1973)	82%

ARVHI = Appraisals and Reactions to Visual Hallucinations Interview (Dudley et al., 2012); CASH = Comprehensive Assessment of Symptoms and History (Andreasen et al., 1992); DSM = Diagnostic and Statistical Manual of Mental Disorders; ESM = Experience sampling method; fMRI = functional Magnetic Resonance Imaging; NEVHI = North-East Visual Hallucinations Interview (Mosimann et al., 2008); NIMH = National Institute of Mental Health; OCCPI = Operational Criteria Checklist for Psychotic Illness (McGuffin et al., 1991); PSYRATS = Psychotic Symptom Rating Scales (Haddock et al., 1999); SCID = Structured Clinical Interview for DSM Disorders; VHQ = The Visual Hallucinations Questionnaire (van Ommen et al., 2019)

studies were case reports about one to three individuals offering observations of phenomenology in VH in a narrative way. Three studies employed a multiple baseline single-case design studying a range of interventions primarily aimed at changing aspects of psychopathology or distress related to the experience of VH, but also providing information on phenomenology.

VH measures differed by design and research question. Seven studies used idiosyncratic measures, including diaries, drawings and verbal descriptions of VH. Three studies used standardised and validated self-report or clinician-administered measures. Three studies used clearly described, but not standardised, interviews or questionnaires to investigate VH phenomenology. Two studies used experience sampling methods (ESM). Case reports did not employ specific measures and described the experiences of individuals with a diagnosis of non-affective psychosis. In one case narrative analysis of a diary was employed.

Quality ratings ranged from 68% (Small et al., 1966) to 100% (Thomson et al., 2017) highlighting vast quality differences. The average rating was 85%. Given the small number of studies meeting inclusion criteria and variety in study design and measures, this review did not implement a limit determining if a study was of satisfactory quality for inclusion in the review, as it was thought to be important to report on all available data in this neglected research area. However, studies with lower quality scores are likely to have been more susceptible to bias. All studies lacked detail on participant response rate to determine whether the final included sample was representative of the target population. Individual study quality will be reflected on when synthesising results attempting to provide a thoughtful narrative picture of evidence integrating and comparing evidence of studies of varying quality and design. The impact of overall quality of the reviewed empirical evidence will be considered in the Discussion section.

To allow for meaningful and coherent synthesis of these studies, which were heterogeneous in both research question and design, results are reported by dividing them into two themes, phenomenology of VH (Table 2) and impact of VH (Table 3), with further subsections.

Phenomenology

Temporal Aspects of VH. Ten studies reported on temporal aspects of VH even though they were not an explicit or sole focus of any study. Most commonly the issue of frequency was addressed. Four studies employing a cross-sectional design (Delespaul et al., 2002; Oorschot et al., 2012; Small et al., 1966; van Ommen et al., 2019) reported mixed findings ranging from describing them as isolated and infrequent experiences (Small et al., 1966) to high frequencies with almost half the sample (48%) in van Ommen et al.'s (2019) study saying that they experienced VH at least once a day. Similarly, two studies using ESM as a measurement tool found a variety of experiences. They defined frequency as the "count of valid reports of hallucination occurrence over the total of valid beeps" (Delespaul et al., 2002, p. 99). In the first study, one participant experienced VH constantly (i.e. on each recorded beep), while 14% of participants reported VH 50% of the time. On average participants experienced VH at around a quarter of the measured time points (Delespaul et al., 2002; Oorschot et al., 2012).

Diverse findings were also reported in other studies, with a single case design reporting on a female patient with five years of antipsychotic resistant VH, Chiu et al., (1988) found that the participant experienced VH approximately 60 times a day. Thomson et al., (2017) found that VH frequency ranged from daily to weekly among five participants. The three participants in the only case report (Hoffman & Varanko, 2006) looking at frequency reported VH episodes occurring multiple times an hour.

Three cross-sectional studies reported great variation in terms of duration of VH, too. Frieske & Wilson (1966) reported that 75% of participants responded to questions about the duration of VH that they were only broken by sleep. Delespaul et al. (2002) used statistical means to calculate average episode durations of 144 minutes and a cumulative time of VH of 3 hours and 57 minutes a day. However, van Ommen et al. (2019) reported participants stating that considerably shorter durations were also common with 7% of participants experiencing VH of less than 1 second, 30% participants experiencing VH lasting 1–10 seconds and 48% experiencing VH lasting longer that 10 seconds, thereby showing that a third of their sample exclusively experienced VH shorter than 10 seconds, which appears to be a striking contrast to previously reported findings. In addition, they showed that 11% of participants experienced all durations at equal measures showing that variation does not only exist between participants but also within participants. Only 4% of participants reported VH that were almost continuous. Similarly, case studies found variation, a man diagnosed with schizophrenia who wrote a diary which formed the basis for narrative analysis (Karlsson, 2009) described experiencing VH that ranged from 15 -20 minutes to near continuous levels, whilst Oertel et al. (2007) measured an average duration of VH of 28 seconds.

Only two studies addressed the question of *when* VH were most likely to occur. Based on self-report, the majority of participants experienced VH irrespective of the time of day, 74 % (Frieske & Wilson, 1966) and 67% (van Ommen et al., 2019) and a minority of participants ranging from 5% to 15% experienced VH at specific times of day (e.g. day, evening or night) only.

In summary, temporal aspects of VH have been reported to be very diverse and much variation appears to exist in frequency and length of VH.

Perceptual Qualities of VH. The following section describes a range of perceptual qualities of VH including location, appearance and intensity.

Location. One study (Bracha et al., 1985) found that VH usually occurred in the visual hemifield processed by the dominant cerebral hemisphere and concluded that that there might be dominant-hemisphere dysfunction in schizophrenia. Focussing on location within the context of the surrounding environment, three cross-sectional studies found that the majority of VH were relatively close: 72% of participants described them as "nearby" or at least within the same room (Frieske & Wilson, 1966) and 81% found them to be within their ordinary visual range (Zarroug, 1975). Adding specificity, participants reported that VH were right in front of them (48%), in the corner (11%) or both (33%) (van Ommen et al., 2019). About half the participants reported that their VH did not move along with head or eye movement (52%), while a quarter reported that they did (26%), and few said that they had experienced both (7%). Interestingly, 15% of participants were not sure how to answer this question saying that they did not know (van Ommen et al., 2019). However, sizable minorities of VH were perceived as outside the room (28%, Frieske & Wilson, 1966) or somewhere beyond ordinary sensory range (e.g. a far-away town) (14%, Zarroug, 1975). Additionally, 7% described VH located on their own body (Zarroug, 1975) and in a case report miniature VH of animals were perceived as embedded within food (Grover, 2012).

Appearance. This review defines the concept of appearance simply as the way something looks, and thereby encompasses a wide range of information, which is detailed in Table 2. In summary, VH are frequently seen as clearly as perceptions evoked by visual stimuli (Chiu et al., 1988; Frieske & Wilson, 1966; Karlsson, 2009; Oertel et al., 2007; Small et al., 1966; van Ommen et al., 2019), coloured (84%, Frieske & Wilson, 1966), three dimensional (Karlsson, 2009; Small et al., 1966), normally sized (68%, Frieske & Wilson,

1966; 48%, van Ommen et al., 2019) resembling real animals or figures including movement (Grover, 2012; Oertel et al., 2007) and shadows (Oertel et al., 2007).

However, sizeable minorities of participants reported experiencing VH that differed from veridical perceptions in detail (45%) and size (26%) (van Ommen et al., 2019); or were seen as miniature objects (Grover, 2012). Approximately 20% of participants reported that their VH had no colour, were transparent and/or did not have any intrinsic movement (van Ommen et al., 2019).

Case reports reported on perceptual experiences which are possibly unusual. However, they highlight the potential uniqueness of experience such as seeing VH embedded in otherwise veridical perceptions of faces of actual persons (Hoffman & Varanko, 2006) describing a scenario in which VH and the environment combine into a vision.

Intensity. Delespaul et al. (2002) found VH intensity to be constant over the course of an episode, which was in contrast to AH. Similarly, in another cross-sectional study, 67% percent of participants reported that their VH appeared suddenly and only 22% experienced VH appearance as gradual (van Ommen et al., 2019).

Content. Ten studies reported on the content of VH in differing detail. Three cross-sectional studies reported on major themes of VH. It was found that human figures were most common across studies and cultures (Small et al., 1966; Zarroug, 1975) with Zarroug (1975) specifying that 20% of participants in a Saudi Arabian sample saw religious figures. Animals also appeared to be a re-occurring theme with 47% (Small et al., 1966) and 7% (Zarroug, 1975) describing to see them.

Taking a different approach, van Ommen et al. (2019) distinguished between simple, geometric and complex VH. They found that 89% of their sample experienced complex VH (e.g. faces, people, animals and landscapes), 67% experienced simple VH (e.g. flashes of light

and shapeless colours) and 22% experienced geometric VH (e.g. spider webs, honeycombs and spirals). This was the only study exploring whether and how a combination of content may be experienced by one person. It was found that 63% of people experienced multiple types of VH. Geometric VH were not experienced in the absence of other VH (van Ommen et al., 2019). This chimes with Small et al.'s (1966) sample with 20% of people saying they saw things other than people and animals. Zarroug (1975) did not report on VH other than animals or (human) figures, however, it could be assumed that participants were not asked about other forms of VH rather than that they did not experience them. Seven case reports and studies employing single case designs provided more vivid and complex descriptions of VH content. For example, one woman described a scenic hallucination with negative content. She saw demons with long tongues and single horns trying to hurt people with axes, which were subsequently saved by angels driving the demons away (Chiu et al., 1988). Similarly, a narrative analysis of a diary vividly described the varied experiences of a man diagnosed with schizophrenia (Karlsson, 2009). VH content ranged from seeing a girl in his flat and unwanted events (e.g. seeing someone's car he did not want to visit him being parked outside his house) to the experience of 'images of his thoughts', luminous points as well as shadows and silhouettes of people. Importantly, this diary was a document that captured not only what researchers asked about, but what appeared important as part of the lived experience. Hence, it may provide an insight into the complexity of VH experienced by a man who declined to take medication during an acute episode of non-affective psychosis. Hoffman and Varanko (2006) focussed on a specific type of VH, lip movements or sign language that were superimposed on veridical perceptions of people (i.e. their faces or hands and arms). Adding context to these descriptions from a cross-sectional study (van Ommen et al., 2019), it should be taken into account that such complex hallucinations including story-like elements appear to be a rare occurrence. Grover et al. (2012) focussed

on a woman describing miniature snakes, pigs and dogs and the remaining studies found participants saw a combination of figures (real and fantastical), animals and objects (Oertel et al., 2007; Thomson et al., 2017; Wilson et al., 2016).

Combination of VH with Hallucinations in Other Modalities. All studies provided some information on whether VH occurred in combination with other types of hallucinations, however, the detail provided varied considerably. Five cross-sectional studies addressed the topic without distinguishing between fused, simultaneous and separate hallucinations, thereby not providing crucial information when aiming to understand the subjective experience of VH. Bracha et al. (1985) found that 39% of participant also reported experiencing AH, however, the majority of studies presented much higher numbers of participants experiencing a variety of hallucinatory phenomena ranging from 79% to 100% (Frieske & Wilson, 1966; Oorschot et al., 2012; Small et al., 1966; Zarroug, 1975), which appears to hold true across time and culture.

Employing ESM it was found that participants who had reported both VH and AH experienced VH without simultaneous AH only 6% of the time (Oorschot et al., 2012) and reported hearing voices more often during VH than when not experiencing VH (Delespaul et al., 2002). Unfortunately, it was not investigated whether these experiences were simultaneous or fused.

Only one cross-sectional study specifically addressed whether VH were fused with hallucinations in other modalities (van Ommen et al., 2019). It was found that 22% of participants experienced VH that always had an auditory component, 11% experienced VH that sometimes had an auditory component and 67% experienced VH that never had an auditory component. Importantly, participants with only simple VH did not report any auditory component. Taking the studies' results together it can be tentatively concluded that VH seem to mostly be experienced by people who also experience hallucinations in other

modalities and that they often occur at the same time. However, experiencing fused VH that have components experienced across different modalities appear to be less frequent.

Looking at case reports can add some experiential detail to fused hallucinations, highlighting that they seem to present as complex and containing a narrative. For example, one woman saw devils that she could hear repeating her thoughts and insulting her (Chiu et al., 1988). Another woman, who also experienced unrelated commanding voices, experienced VH that had a tactile component, as she saw miniature animals that she could

Table 2

Phenomenology of VH

Study	Temporal aspects of VH (e.g. frequency and duration)	Perceptual qualities of VH (e.g. appearance, location, intensity)	Content of VH	Combination with other modalities
Bracha et al. (1985) n=44	Not reported	**Location:** VH are usually perceived in the visual hemifield processed by the dominant cerebral hemisphere.	Not reported	38.7%: also report AH (not clear whether these are fused or separate).
Chiu et al. (1988) n=1	**Frequency at baseline and after intervention:** Approximately 60 times every day.	**Appearance at baseline and after intervention:** Very vivid; participant is able to draw them.	**Content at baseline and after intervention:** Demons with long tongues and single horns trying to hurt people with long axes, then angels come to drive the demons away saving people.	**At baseline:** VH of complex nature including several story-like elements (i.e. delusional content). VH fused with AH: devils repeating thoughts, commenting on behaviour and insulting participant. **After intervention and at follow-up:** AH including fused hallucinations reduced significantly, however, VH remained.
Delespaul et al. (2002) n=57	**Frequency:** 1 participant: constant VH. 14%: 50% of the time. In general VH occurred at 26.32% of the time points investigated (excluding participant hallucinating constantly).	**Intensity:** Constant over the course of an episode (this is in contrast to AH).	Not reported	When comparing moments with VH and without VH, participants rated themselves as “hearing voices” more often ($F(1,14) = 5.42$; $p < 0.04$).

	Duration: Cumulative amount of hallucination time was 3 h and 57 min a day (from 7:30 to 22:30). Average episode duration: 144 min.			
Frieske & Wilson (1966) n=50	**Time of day:** 74%: both during day and night. 16%: day only. 5%: night only. **Duration:** 75%: continuously only broken by sleep.	**Appearance:** 96%: three dimensional. 84%: technicolour. 82%: clearly defined and visualised. 88%: objects change (size colour etc). 68%: see objects in normal size 62%: brightly lighted many with glowing elements, remainder dull. 72%: experienced them as "complete and real". 44%: experienced VH as connected sequences. **Location:** 72%: “nearby” or at least within the room. 28%: far away or outside room.	Not reported	100%: experience VH in combination with other modalities (96% voices; 64% tactile, 48% olfactory, 22% gustatory). (Not reported whether hallucinations are fused or separate.)
Grover et al. (2012) n=1	Not reported	**Appearance:** Miniatures (few cubic centimetres) that resemble real animals in appearance and movement. **Location:** Embedded in food or external objective space.	Miniatures of snakes, pigs and dogs.	Participant feels VH crawling through her body and exiting through her abdomen. At times experiences a sensation of chewing them. Unrelated AH (commanding voices).

Hoffman & Varanko, (2006) n=3	**Frequency:** Participant 1: 7–10 times per hour. Participant 2: 10–20 times per hour. Participant 3: near-continuous.	**Appearance:** Participant 1 & 2: VH embedded in otherwise veridical perceptions of faces of actual persons. Participant 3: Not reported	Participant 1: lip and mouth movements superimposed on otherwise veridical perceptions of faces of actual persons. Participant 2: lip and mouth movements embedded in otherwise veridical perceptions of faces of actual persons. Participant 3: human forms exhibiting lip and mouth movements and producing finger movements and gestures conforming to American Sign Language (ASL). (NB: Participant is not hard of hearing, but proficient in ASL)	Participant 1: fused with AH and kinetic visual hallucinations (e.g. seeing an objectively stationary door open or close). Participant 2: fused with AH. Participant 3: fused with AH.
Karlsson (2006) n=1	**Duration:** First experience of VH: 15-20 minutes.	**Appearance:** Three dimensional.	First VH: topless girl Later VH: 'images of his thoughts', luminous points, shadows, and silhouettes of other people, "pictures" of events participant does not want to happen: e.g. seeing someone's car he does not want to visit him being parked outside his house.	Fused with AH and feeling of "touches"; complex system of beliefs (i.e. delusions) around hallucinations.
Oertel et al. (2007) n=1	**Duration:** Average duration of VH: 28.38 s, (SD=20.80 s, range: 6–74 s)	**Appearance:** Varied in size and colour (but not in content).	Common objects, faces and bodies of people (usually family members) sitting on a table or standing in a landscape.	Current VH only (previous experience of AH, but not fused).

		Images well defined including actual objects, people and their shadows. Perceptions as clear as those evoked by visual stimuli.		
Oorschot et al. (2012) n=48	**Frequency:** VH are present at 22% of the time points investigated. The mean number of episodes is 4.1 (range 1–14) over an episode of ESM (six consecutive days at ten randomly selected time points a day).	Not reported	Not reported	79.2%: both VH and AH. 20.8%: VH only. Participants experiencing VH & AH: AH (without simultaneous VH) at 376 moments (53%). VH (without simultaneous AH) at only 46 moments (6%). Simultaneous VH and AH 287 times (40%).
Small et al. (1966) n=15	**Frequency:** "infrequent" or even isolated experiences	**Appearance:** vivid	47%: Family members 20%: Religious figures (e.g. saints) 47%: Animals 20%: Other	6.7% (1 person): VH only 93.3%: experience mixed variety of hallucinatory phenomena
Thomson et al. (2017) n=5	**Frequency:** Participant 1: weekly Participant 2: Not reported Particpant 3: Not reported Participant 4: daily Participant 5: daily	Participant 5: moving objects as everything in her visual field moved (No further information regarding other participants.)	Participant 1: fantastical creatures such as gargoyles (differed on each occasion) Participant 2: vision of an old woman Participant 3: insects or spiders including a talking insect Participant 4: male figure Participant 5: shadow creatures and moving objects	Participant 3: VH (insect) talks (i.e. fused VH and AH) (No further information regarding other participants.)
Van Ommen et al. (2019)	**Duration:**	**Location:**	66.7%: simple VH (e.g. flashes of light and shapeless colours)	**Auditory component:** 22.2%: Yes

n=27	7.4%: Short duration: <1 s 29.6%: Medium duration: 1–10 s 48.1%: Long duration: 10 s 11.1%: All durations, not 1 mostly 3.7%: Almost continuous **Frequency:** 18.5%: A couple of times 11.1%: <1/week for a longer period 7.4%: About once a week 14.8%: >1/week but <1/day 48.1%: Once or more a day **Part of the day** 11.1%: In the daytime 14.8%: In the evening 4 (14.8) 0%: In the night 0 (0) 0%: In the morning 0 (0) 66.7%: Every part of the day 3.7%: In the daytime, evening, night	48.1%: Right in front 11.1%: In the corner 33.3%: Both **Temporal evolution:** 55%: Constant 18.5%: Changing 25.9%: Both **Normal size:** 48.1%: Yes 25.9%: No **VH intrinsic movement:** 55.6%: Yes 22.2%: No 14.8%: Both **Coloured:** 44.4%: Yes 18.5%: No 10.0%: Both **Spatial frame:** 11.1%: One scene 66.7% Individual things 11.1%: Both **Comparison with true visual percepts:** 11.1%: More detailed 44.4%: Less detailed 29.6% As detailed 3.1%: Both more and less	22.2%: geometric VH (e.g. spider webs, honeycombs, gratings and spirals 88.9%: complex VH (e.g. faces, people, animals and landscapes) 63%: multiple types of VH, mostly simple and complex. 11.1%: only simple VH. 25.9%: only complex VH.	66.7%: No 11.1%: Both Participants with only simple VH did not report an auditory component.

		Transparency: 22.2%: Yes 48.1%: No 18.5%: Both **Appearance:** 22.2%: Gradually 66.7%: Suddenly 7.4%: Both, not 1 predominantly		
Wilson et al. (2016) n=2	Participant 1: Not reported Participant 2: VH almost constant	Not reported	Participant 1: Human figures. Participant 2: Variety of simple unformed VH e.g. small moving objects on the floor.	Participant 1: Reports hearing his vision speak occasionally and has heard VH when it was not present, but had not experienced other AH. Participant 2: VH never makes a sound and does not speak; however, participant is affected by other AH, on a daily basis that are distressing and disabling to him (i.e. AH and VH not fused but occur simultaneously).
Zarroug (1975) n=43	Mostly during the day and often continuously.	**Location:** 81%: within ordinary visual range. 7%: located on their own bodies. 14%: somewhere beyond their ordinary sensory range (e.g. a far-away town)	86%: real person or persons. 7%: figures that are partly human. 7%: animals (including insects).	81%: VH and AH. 19%: VH only. (not reported if fused or separate)

feel crawling through her body and exiting through her abdomen (Grover, 2012). Similarly, a participant reported feelings of "touches" from his VH (Karlsson, 2009). Interestingly, Wilson et al. (2016) reported on a case of one participant hearing his VH speak occasionally when present, but also hearing the vision speak when it couldn't be seen as if in another room. He did not experience any other AH. Focusing on VH showing mouth movements in veridical perceptions of faces, Hoffman & Varanko (2006) found that all participants experienced VH fused with AH which matches content and appearance of the experience.

Impact

Appraisals of VH and Sense of Control. Three studies explicitly reported on participants' sense of control over VH. 94% of participants in the cross-sectional study by Frieske and Wilson (1966) and the participant in Chiu et al.'s (1988) single case design study felt no sense of control over their VH, which is in line with the earlier introduced definition of VH (David, 2004). Linked to this sensation, participants had higher fear of losing control during a VH than in non-hallucinatory moments (Delespaul et al., 2002).

Six studies mentioned participants' appraisals of VH. VH were mostly appraised as negative, malevolent and of personal significance: In the only cross-sectional study addressing appraisals, 88% of participants felt that VH had personal implications (Frieske & Wilson, 1966). Similarly, Thomson et al. (2017) found that personally significant appraisals were common with two participants thinking that they were "losing control" and two others appraising VH as a sign that they were "going crazy" (p.4). One participant thought that demons in her VH were controlling her motions (Chiu et al., 1988) and another was convinced that others were the source of VH (reinforced by frequent occurrences of VH in the presence of family) (Hoffman & Varanko, 2006). As recorded in his diary, one participant believed that he functioned as a projector to which others could send images as a form of black magic (Karlsson, 2009).

Four studies addressed the question of whether participants thought their VH to be real and found a mix of beliefs. For example, in a cross-sectional study 52% of participants held the belief that their VH were always real, 30% believed them to be real sometimes and 19% never thought they were real (van Ommen et al., 2019). Importantly, belief about non-reality of VH did not necessarily link to a positive or neutral appraisal of VH, as can be seen in the examples of a research participants reporting that even though they were aware that the VH was not a real person, worried that the VH 'might hurt the people I love' (Thomson et al., 2017) or found their occurrence puzzling (Hoffman & Varanko, 2006).

Emotional Experience. As would be expected from studies investigating VH in clinical samples, and therefore by definition experiencing distress, the majority of participants appeared to experience negative emotions related to VH. In case reports participants reported anxiety and fear (Chiu et al., 1988; Karlsson, 2009; Thomson et al., 2017; Wilson et al., 2016). Similar results could also be seen in cross-sectional studies with 62% (Frieske & Wilson, 1966) and 40% (Small et al., 1966) and 86% (van Ommen et al., 2019) (11%: A bit, 19%: Quite, 56%: Very) reporting to experience fear. Two studies using ESM recorded the emotional experience of participants contemporaneously, and hence not necessarily linked, to their VH. Delespaul et al. (2002) found that anxiety levels during a VH co-varied with VH intensity. Oorschot et al (2012) added a temporal element to this by finding that VH were preceded by a decrease in positive feelings (e.g. cheerful, relaxed) and an increase in negative feelings (e.g. anxious, sad, lonely) and these negative feelings were sustained during VH, but did not remain after VH ended.

Investigating the link between emotional experience and phenomenological nature of VH, van Ommen et al., (2019) found that patients with complex VH (e.g. faces, people, animals and landscapes) and VH with an auditory component were more likely to be very frightened than participants with simple VH.

Table 3

Impact of VH on Individuals Experiencing Non-Affective Psychosis

Study	Sense of control and appraisals	Emotional experience	Behavioural responses
Chiu et al. (1988) n=1	**Sense of control:** No sense of control. **Appraisal:** Beliefs devils (content of VH) control her motions.	Very anxious	**Observable behaviour:** Stood motionless until devils (content of VH) disappeared. This was observed several times a day for prolonged periods on inpatient ward.
Delespaul et al. (2002) n=57	**Sense of control:** Comparing hallucinatory and non-hallucinatory moments, participants had more "fear of losing control" ($F(1,14) = 7.48$; $p < 0.02$).	**Emotions associated with VH intensity:** Anxiety levels co-varied with hallucinatory intensity. No anticipatory anxiety was found.	**Behaviours associated with VH intensity:** In daily life both maximal engagement (i.e. work) and maximal disengagement (i.e. being alone and doing nothing) are coping situations for hallucinatory intensity. Being in the company of other persons or engaging in passive leisure activities were not.
Frieske & Wilson (1966) n=50	**Sense of control:** 94%: felt no sense of control - neither in making them occur, continue nor stop. **Appraisal:** 88%: felt that VH had a personal implication.	62%: Fear 38%: Pleasant or indifferent	54%: some form of action (e.g. running away, hitting at VH or telling others about them)
Grover et al. (2012) n=1	Not reported	Not reported	Reduces food intake due to position of VH in her food and occasional sensation of chewing them
Hoffman & Varanko, (2006)	**Appraisal:**	Not reported	Not reported

n=3	Participant 1: convinced that others in his immediate environment were the source of VH (reinforced by frequent occurrence of VH when in the presence of family or other familiar persons) Participant 2: did not believe VH to be real and was puzzled by their origin		
Karlsson (2006) n=1	**Appraisal:** VH thought to be consequences of what malevolent people do in the form of 'black magic'; Believed that he functioned as a 'projector' to which others could send images.	Fear Sense of strength / resilience Quote: "What a [strong] mind I must have, even though it has often been difficult."	Isolated himself with VH and other extraordinary experiences saying that they became his 'closest family', and one particular VH his 'girlfriend'.
Oertel et al. (2007), Germany n=1	**Belief about reality of VH:** Participant convinced VH (people) were in the room but that no other person could perceive them.	Not reported	Not reported
Oorschot et al. (2012) n=48	Not reported	**Before VH:** decrease in positive affect (PA) and an increase in negative affect (NA) and delusional intensity. **During VH:** increased NA and delusional intensity. **After VH:** Delusional intensity was the only variable (not PA or NA) which remained elevated after the VH ended. NB: PA comprises of feeling cheerful/relaxed/satisfied/globally well. NA	Not reported

		constitutes feeling unsecure/lonely/anxious/sad/irritated/guilty.	
Small et al. (1966) n=15	Majority of participants recognised VH as unusual and as symptom of illness indicating that VH were "not especially disruptive or disturbing" (p. 352) compared to other symptoms of their illness. Example: a lion walking through the ward interpreted as a sign that it was good to be on the ward.	40%: Fear 26.7%: Pleasure 33.3%: Minimal reaction	Not reported
Thomson et al. (2017) n=5	Participant 1: thinking 'I'm losing control'. Participant 2: even though aware the VH not a real person, worried that the VH 'might hurt the people I love'. Participant 3: thinking 'I'm going crazy' Participant 4: thinking "I'm going crazy" Participant 5: thinking "I'm losing control" **Intervention and follow-up:** Significant changes in self-reported daily recordings of conviction of appraisal in three participants	**Baseline:** Participant 1: anxious Participant 2: terrified Participant 3: anxious Participant 4: anxious Participant 5: stressed and overwhelmed **Intervention and follow-up:** Significant changes in self-reported daily recordings of strength of affect in three participants.	**Baseline:** Participant 1: often distract himself Participant 2: avoidance behaviours Participant 3: talking back to the VH Participant 4: trying to distract himself Participant 5: closing her eyes to cope with presence of VH **Intervention & follow-up:** No significant changes observed in use of safety behaviours in any participants.
Van Ommen et al. (2019) n=27	**Belief about reality of VH:** 19%: Never 30%: Sometimes 52%: Always	**Frightened by VH:** 15%: Not 11%: A bit 19%: Quite	Not reported

		56%: Very Ratings depend on VH complexity: Only simple VH: No participant had ever been 'very' frightened by their VH. Complex VH: 57% (4 out of 7) rated their most frightening VH as 'very' frightening. Multiple types of VH: 65% (11 out of 17) rated their most frightening VH as 'very' frightening.	
Wilson et al. (2016) n=2	**Appraisals:** Participant 1: appraised VH as an indication that he was vulnerable to being attacked by people (which he called 'things') and was at immediate risk of physical harm. No significant change post-intervention or at follow-up. Participant 2: appraisal was that something supernatural, like demons were causing VH.. No significant change post-intervention or at follow-up.	Participant 1: Fear No significant change post-intervention or at follow-up. Participant 2: Anxiety No significant change post-intervention or at follow-up.	Participant 1: leave the room or even the house. No significant change post-intervention or at follow-up. Participant 2: difficulties going to sleep. No significant change post-intervention or at follow-up.
Zarroug (1975) n=43	**Belief that VH is shared with others:** 81%: felt that VH was not shared by others 19%: felt VH was shared by people within the sensory range of hallucination source **Appraisal:** Example participant: "Some people are doing this to me to drive me made […]. It's magic." (No quantitative analysis)		**Overt behaviour:** 72%: no effect on observable behaviour 26%: responded with verbal activity such as talking 1 participant (2%): covered mouth when seeing VH fearing that the insects would crawl into it.

However, in two studies approximately a third of participants reported pleasure or indifference regarding their VH (Frieske & Wilson, 1966; Small et al., 1966). Further, in a case report a participant described feeling a sense of strength and resilience noting in his diary "What a [strong] mind I must have, even though it has often been difficult." (Karlsson, 2009, p. 94). Here, the participant clearly linked a positive appraisal of the self with a positive feeling.

Behavioural responses. Taking active measures to protect oneself (e.g. hitting (Frieske & Wilson, 1966), standing motionless to avoid being controlled (Chiu et al., 1988), covering the mouth (Zarroug, 1975)) appear to be common, as were more passive actions such as avoidance and escape with the same aim of making oneself safer (Thomson et al., 2017; Wilson et al., 2016). Two cross-sectional studies aimed to quantify reactions to VH and found that 26% (Zarroug, 1975) and 45% (Small et al., 1966) of participants responded with observable actions to their VH, however, other participants may have responded in less observable ways (e.g. talking back to VH in their head) without researchers' knowledge.

The reasons behind behaviours are not discussed. For instance, it remains unknown whether individuals leave the proximity of a VH in fear of being actually hurt by them or whether they are attempting to escape the experience of their VH without believing they would come to physical harm. Answering such questions would be clinically important. Further, limited knowledge on the relationships between appraisal and behaviour can be observed in a comment by Small et al. (1966) who express surprise at their finding that participants were able to differentiate VH from reality, yet still interacted with them. Given the complexity and potential interactions between phenomenology, appraisal and behaviour such a comment highlights the limited understanding of VH. Moreover, the literature has barely engaged with this complexity, and there is a dearth of research into individual and subjective experiences of VH.

Discussion

In this final section the review's findings will be summarised and considered within the limitations of the review process and included studies. Then clinical and theoretical implications will be discussed before exploring potential avenues for future research. The section will close with concluding remarks.

Overview of Findings

The aim of this review was to synthesise the literature on the phenomenology and impact of VH in non-affective psychosis. Given the heterogeneity of the topic, research papers covering any aspect of phenomenology and impact on individuals with diagnoses of schizophrenia spectrum disorders between the ages of 18 and 65 were included in the review, regardless of design or research question. A total of 14 studies met inclusion criteria but there were wide ranging differences between studies, which complicated synthesis and interpretation of results. Research differed markedly on aspects of phenomenology and impact reported, diagnostic procedures, sample size, and outcome measures, which is likely to have affected the outcome of each study. Whilst the overall quality of studies was deemed acceptable given the designs employed, the standard of evidence remains low, with seven studies being case reports or single-case design studies.

The review indicated that VH differ markedly between individuals and can take many forms. In particular, much variation appears to exist in frequency and length of VH. While there were also differences in location, appearance and content of VH, patterns emerged showing that the majority of people seemed to see VH of human figures, which were nearby and their appearance was comparable to veridical perceptions. However, sizeable minorities had differing experiences. For example, VH content also encompassed both simple VH such as geometric patterns and complex VH taking on scenic qualities. Additionally, VH mostly occurred in combination with hallucinations in other modalities, however, the review was

not able to establish whether hallucinations mostly occurred separately, simultaneously or were fused, hence, details on this phenomenological aspect remain vague.

As could be expected in a review of studies exploring clinical samples, most participants were negatively impacted by their VH. Appraisals of malevolence and personal significance of VH were prevalent and most participants reported feeling distressed by their VH. However, a more mixed picture arose when looking at behavioural responses with some participants using coping strategies that involved hitting VH and escaping their presence, while others appeared to not react, or at least not in an observable way, which does not exclude the use of internal strategies.

Limitations

The results of this review should be interpreted in light of limitations in the review process and of included studies. As described, studies adopted varying measures and designs, which meant that they could not be statistically compared, precluding firm conclusions being drawn about the extent of impact of VH and prevalence of individual phenomenological aspects.

The studies' specific research questions did not always target phenomenology or impact but reported on aspects relevant to this review as a "side product". Including these articles was thought to be beneficial in order to report on all available data, potentially calling attention to particular aspects in a research area that has been neglected, however, individual accounts are unlikely to be comprehensive. This highlights that without comparable outcome measures phenomenological research is inherently prone to validity and reliability problems, as data are by definition subjective (Lowe, 1973).

None of the studies (see quality appraisals) reported how many participants who were approached to take part in research actually accepted. Responder bias may be especially problematic in VH research as participants with particular experiences or

emotional reactions (e.g. fear of VH) may be inclined against participating in research on the topic. Such threat to external validity has been reported in research assessing AH as psychiatric patients invited to participate declined, expressing concern that the interview would be frightening (Honig et al., 1998). Additionally, interview techniques, administration of questionnaires and/or questions asked are of utmost importance, as it has been reported that hallucinations thought to be rare, were not reported as participants had not been directly asked about them (Lowe, 1973; Rubert et al., 1961). This raises difficulties in designing questions that are neither leading nor too superficial to produce accurate data. Hence, the results of all included studies must be treated with caution. However, by synthesising data from a range of research designs and the inclusion of case reports this review added some insight into aspects of VH not reported on routinely.

Theoretical Implications

Firstly, this review suggests that multimodal hallucinations are common in people with non-affective psychosis who experience VH, which may provide some explanation of researchers' focus on AH, as they regularly occur without simultaneous VH. However, co-occurrence of AH and VH was identified as an indicator of more severe illness (Oorschot et al., 2012) and it can be hypothesised that whether hallucinations are experienced in different sensory modalities at the same time and whether these are congruent in content (e.g. devils insulting them (Chiu et al., 1988)) is of crucial importance for subjective experience. This suggestion raises the question of whether, at least for people with non-affective psychosis experiencing VH, a model of multimodal hallucinations should be developed and applied (Dudley et al., 2018).

Secondly, it has to be said that many aspects of VH phenomenology have not been systematically researched and, in particular, the possible linkages between each other, to

distress and illness severity have not been inquired about systematically. Such gaps continue to form a barrier to the development and evaluation of VH models.

Models that argue VH result from misattribution of internal events to external sources cannot be assessed phenomenologically due to an absence of large-scale studies on these aspects (e.g. VH content and memories). However, increased levels of negative emotions during VH (Oorschot et al., 2012) and reports of VH related anxiety and fear (Frieske & Wilson, 1966; van Ommen et al., 2019) are in line with existing knowledge on AH. Additionally, previous studies have linked negative emotional states to a deterioration in source monitoring deficits in psychiatric patients (Larøi & Woodward, 2007; Morrison & Haddock, 1997) and have found increased responses of limbic networks during auditory paradigms including emotional content in research participants experiencing hallucinations compared to those who do not (Escartí et al., 2010; Kang et al., 2009), which allow very tentative hypotheses that source monitoring deficits may also be at play in the formation of VH. Further research including comparisons of groups with and without VH, and specific phenomenological features, is needed to firm up this suggestion.

A further hypothesis posits that deficits in suppressing irrelevant cognitions (e.g. memories or thoughts) may be an underlying cause of hallucinations leading to the intrusion of cognitive material into consciousness (Jardri et al., 2016). Support for this perspective can be found in research showing false recognition in memory tests and enhanced intrusion errors in patients with schizophrenia experiencing AH (Brébion et al., 2007). Such unintended memory retrieval has also been documented in one included case study of a patient with schizophrenia experiencing VH (Oertel et al., 2007) suggesting it may be a modality-general process, however, further research is needed to establish the extent of this model's relevance.

Clinical Implications

Several clinical implications can be derived from the results of this systematic review.

First, whilst some phenomenological features of VH are shared by a majority of people with non-affective psychosis, the review has shown that there is vast overall phenomenological diversity. This understanding should be taken into account by clinicians asking detailed but open questions about an individual's experience and devising specific and personalised treatment. Asking clearly defined questions including the assessment of the categories (e.g. frequency, content, beliefs about VH) identified by this review, can convey understanding and normalise patients' experiences. Additionally, being aware of and referring to existing evidence as synthesised by this review can have important psychoeducational impact.

Secondly, therapies that target both the phenomenologically diverse and rich nature of VH and factors related to their negative impact should be investigated and employed. For instance, Gauntlett-Gilbert and Kuipers (2005) showed that distress in a clinical sample with mixed psychiatric diagnoses was due to what hallucinators thought would be the consequences of their VH. Linking this to this review's findings that most participants with non-affective psychosis held negative beliefs about their VH and experienced fear and anxiety, even when a majority experienced relatively benign VH content, shows that the emotional impact of VH may be due to appraisals of VH. Hence, promising treatment approaches, as suggested by Collerton and Dudley (2004), should attempt to support a person to question and change their appraisals through a range of CBT techniques such as cognitive restructuring targeting beliefs of VH power (Pienkos et al., 2019) or imagery rescripting (Collerton & Dudley, 2004). However, the review has also shown that a number of people experience complex VH comprised of objectively unpleasant content involving

several senses. Different treatment approaches such as exposure to the distressing content, for instance with the help of Avatar Therapy as currently explored for AH (Craig et al., 2015), until habituation occurs could be explored (Collerton & Dudley, 2004).

Thirdly, considering phenomenological diversity of VH may also provide information about changes in a patient's condition. AH content in a group of patients with schizophrenia has been found to be threatening in an acute phase but more socially focussed during remission (Larkin, 1979). It is therefore plausible that phenomenological variations of VH also reflect important changes within an individual. This is an observation which is in line with research suggesting that effective treatment often presents as a qualitative change defined by an improvement in phenomenological characteristics (frequency, content etc.) (Larøi, 2006) and should be assessed and tracked by clinicians using appropriate assessment tools (Aynsworth et al., 2017).

Future Research

There are two broad options for future research. The first line of enquiry relates to further comprehensive phenomenological examination of VH and their impact on the individual. Qualitative research aiming to offer rich descriptions of lived experience are vital for an authentic understanding of VH. Given the results of this review, a multimodal standpoint should be taken. So far, attention has primarily been placed on modality concurrence in time, however, concurrence of thematic content has not been investigated. Large scale quantitative research is needed for the investigation of relationships between phenomenological features and other variables of importance such as prognosis, functioning and distress. These key questions should also be addressed in longitudinal study designs as change in VH over time remains particularly under researched.

The second line of enquiry focusses on the understanding of the continuum model. Learning to identify predictors of transition to psychosis may contribute to the refinement

and development of cognitive and neurobiological models. The scope of such extended study should also have clinical utility in terms of predicting the development of clinical disorders on the basis of observable characteristics with clinical relevance and their treatment. Further research, ideally on a larger scale involving randomised clinical trials, into the treatment of VH in patients in need of care is needed, which is likely to involve the examination of the efficacy of existing and new interventions targeting this particular symptom.

Conclusion

The aim of this review was to synthesise VH phenomenology and determine the nature of their impact on individuals experiencing non-affective psychosis. The review shows that there is much variation in phenomenology with some areas of common experience such as content and multimodality as well as negative beliefs and emotional consequence. However, the data reviewed did neither allow for firm conclusions to be drawn about prevalence of phenomenological characteristics nor establish links between VH impact and particular characteristics. Compared with research on AH, research on VH is still in its infancy. Priorities for future research include further examining VH phenomenology and clarifying the nature of the relationship between specific phenomenological aspects and impact on individuals experiencing VH, as well as understanding VH within the notion of a continuum including the role of appraisals and impact.

Psychotic-Like Experiences and (Hypo)Mania in the Perinatal Period: The Role of Appraisals

Abstract

Postpartum Psychosis (PP) is a mental health disorder which has potentially severe consequences for mother and child. Research on PP is underdeveloped, although psychotic-like experiences (PLEs), subclinical hallucinations and delusions, amongst perinatal women are beginning to be explored in order to learn more about risk factors for the development and maintenance of PP. However, the psychological mechanisms underlying such experiences are yet to be understood. As Bipolar Disorder (BD), and in particular mania, have been found to be linked with PP in terms of recurrence and symptom presentation, psychological mechanisms associated with BD could be applicable to PP.

The study therefore aimed to answer whether PLEs in the perinatal period are linked to (hypo)mania, whether mania-related appraisals are associated with perinatal (hypo)mania, whether PLEs are associated with distress, and to what extent psychosis and mania-related appraisals mediate the relationship between PLEs and distress.

In a cross-sectional design, 403 women in the perinatal period were recruited via social media and completed an online survey which included measures of PLEs (delusional and hallucinatory experiences), (hypo)mania, psychosis and (hypo)mania related appraisals and distress.

Results indicated that PLEs and (hypo)mania were not associated in the perinatal period, but appraisals of internal mood states were associated with (hypo)mania during this time. Further, it was found that delusional ideation predicted distress, while hallucinations did not. The mediation model was not a good fit for the data, showing that biased appraisals did not positively mediate the relationships between PLEs and distress.

The results indicate that cognitive appraisals known to be linked to psychotic disorders in the general population may not influence distress during the perinatal period or, by way of conclusion, vulnerability to PP specifically. Treatment approaches that consider individual symptoms separately may therefore be warranted. Future research should consider recruiting 'at-risk' perinatal groups and focus on utilising experimental, prospective and longitudinal designs in order to investigate relationships between PLEs and distress in the perinatal period.

Introduction

Mental health difficulties in the perinatal period, defined as the time between conception and 12 months after birth, are a common occurrence. The National Institute for Health and Care Excellence (NICE, 2016) estimates that 10-20% of pregnant women and new mothers experience difficulties. Untreated perinatal depression, anxiety and psychosis have been linked to poor health outcomes for both mother and infant, attachment difficulties and negatively affected mother-infant bonding (Fisher et al., 2012; Hoffman et al., 2017; Robertson & Lyons, 2003). Having recognised such impact, early identification and effective treatment of perinatal mental health difficulties have become a healthcare priority in the United Kingdom (UK; National Collaborating Centre for Mental Health, 2018). As such, an additional £365 million in funding have been allocated to perinatal mental health services with the aim to offer support to an additional 30,000 women between 2016 and 2021 (NHS England, 2016). Each year, over 1,400 of them are estimated to experience Postpartum Psychosis (PP) in the UK, which is a particularly severe diagnosis posing a range of challenges to mental health services and those experiencing it (Action on Postpartum Psychosis, 2021).

Postpartum Psychosis

PP affects one to two in 1,000 women after childbirth (for a review see VanderKruik et al., 2017). While the boundaries of the concept of PP remain subject to debate (Blackmore et al., 2006), it is typically defined by a rapid onset of symptoms within three days of birth, with women describing feeling elated and energetic, not sleeping and talking more (Heron et al., 2008). Following these early signs, those affected develop delusions of a paranoid, grandiose or bizarre nature, extreme mood swings, cognitive disorganisation, and/or disorganised behaviour (for a review see Sit et al., 2006). Hence, the term is generally used to describe the acute onset of an episode of affective psychosis for up to 90 days

postpartum in women who were well before the birth of their child, even though they may have a history of previous difficulties (Sit et al., 2006).

Treatment. Interventions for the prevention and treatment of PP have largely focused on the use of pharmacotherapy including mood stabilisers, antipsychotics, and hormone therapy, as well as electroconvulsive therapy (Doucet et al., 2011). Preliminary evidence suggests that lithium may be an effective strategy for preventing PP for women with a previous diagnosis of Bipolar Disorder (BD) and that electroconvulsive therapy may be generally effective in treating PP (Doucet et al., 2011). However, guidance on psychological interventions is limited and vague, with the relevant clinical guideline (NICE, 2014) on perinatal mental health merely making reference to psychoeducation and psychological interventions as delivered to all adults experiencing psychosis. In a review, Sit et al. (2006) suggest the use of additional therapies such as cognitive behavioural therapy (CBT), family-focused therapy and interpersonal psychotherapy (IPT), however, due to a lack of research on the effectiveness of these interventions on PP, authors draw from the evidence base on postpartum mood disorders (Dennis & Hodnett, 2007; Zlotnick et al., 2001). This lack of specific clinical guidance highlights a dearth of research into effective psychosocial interventions for PP, stressing the need for research informing evidence-based psychological treatments.

Risk. The risk of suicide for women experiencing postpartum mental illness increases 70-fold in the first year after childbirth (Appleby et al., 1998) and 2 in 1,000 women with PP complete suicide (Cooper et al., 2002). Infanticides rarely occur in PP (Spinelli, 2004), although 9% of women experiencing PP express thoughts of harming their baby, which is a higher percentage than in women with non-psychotic postpartum illness (Wisner et al., 1994). Given their disorganised thinking, some mothers with PP are unable to provide for

their baby's needs and engage in unsafe behaviours related to their child (Kumar et al., 1995).

Prognosis and Outcome. Longitudinal data has shown that the prognosis for women with PP is generally positive and symptoms are typically limited in time (Sit et al., 2006). A meta-analysis found that the overall postpartum relapse risk was 35% (Wesseloo et al., 2015). After an episode of PP arising from underlying BD, around 75% of women remained symptom free after recovery and only 5% developed chronic difficulties with multiple postpartum and non-postpartum recurrences (Protheroe, 1969). Nevertheless, the experience of PP is very distressing for women and their families (Heron et al., 2008). A systematic review of 15 qualitative studies has found that recovering from an episode can be a difficult, complex and lengthy process, in which women need to process their experiences, navigate feelings of guilt and learn to transition to their new role (Forde et al., 2020). Moreover, psychological difficulties frequently remain present after the acute symptoms of PP resolve. For example, it was found that women affected presented with significantly higher levels of depression and anxiety compared to a control group nine months after the birth of their baby and a quarter of them reported impaired psychosocial functioning (Burgerhout et al., 2017).

Risk Factors for the Development of PP. Given the sudden onset of PP, its rapidly changing clinical picture, severity and associated consequences for mother and child, it is important to identify and support women at risk of developing PP (Jones & Smith, 2009). While the aetiology of PP remains poorly understood (Upadhyaya et al., 2014), an increasing number of studies have identified risk factors contributing to PP.

One branch of research has focused on exploring the relevance of previous mental health difficulties and diagnoses in the development of PP. Most importantly, BD and schizoaffective disorder have been found to link with PP in terms of recurrence, symptom

presentation (preponderance of manic symptoms), longitudinal outcomes and family history (Chaudron & Pies, 2003). For example, a recent meta-analysis found that on average 17% of new mothers with a history of BP experience severe episodes of PP (Wesseloo et al., 2015). Women with an accumulation of risk factors face the highest risk of relapse: notably, women with a diagnosis of BP and a previous episode of PP present with recurrence rates of up to 57% (Robertson et al., 2005). In comparison, women with a diagnosis of schizophrenia or depression were found to have much lower rates of PP: 3.4% and 1.9% respectively (Kendell et al., 1987; Mighton et al., 2016). However, while previous mental illness, particularly BD, is a well-known risk factor for PP, it is important to not simply consider it a variant of BD. A large case register study found that about half of the mothers admitted to hospital with PP had experienced no previous psychiatric hospitalisation (Valdimarsdóttir et al., 2009).

Further, obstetric variables significantly impact the occurrence of PP. For example, it has been established that first births, controlling for the number of women who do not have subsequent children, are more frequently linked to the development of PP (Nager et al., 2005; Valdimarsdóttir et al., 2009). Complications during pregnancy and Caesarean sections were not found to be associated with increased risk, however, complications during vaginal delivery more than doubled it (Blackmore et al., 2006; Sharma et al., 2004). While the mechanisms behind such links are not clear, it has been hypothesised that PP could be a stress response related to heightened cortisol levels and excessive sleep disturbances (Nager et al., 2008).

Such suggestions are backed up by research which found that night deliveries were more common among women who developed PP than those who did not (Sharma et al., 2004). Further, reports from women suggest that those who experienced previous episodes of mania triggered by sleep loss were more vulnerable to PP than those who experienced mania without associated sleep loss (Lewis et al., 2018). Hence, sleep loss could be a marker

of increased vulnerability to PP, as is the case for psychosis in the general population (Reeve et al., 2018).

While it was found that non-psychotic postpartum illness such as depression and anxiety were predicted by neuroticism, life stress or severe life events, no such links could be found for PP, which was predicted by previous history of mania, hypomania or schizomania, a vulnerability exacerbated by marital difficulties (Marks et al., 1992; Perry et al., 2016). Also, being a single mother and of older maternal age (>35) increased the risk of PP (Nager et al., 2005; Valdimarsdóttir et al., 2009).

Psychological processes underpinning PP, which are of interest in this study, have rarely been investigated. Drawing on theoretical models of psychosis and BD may be helpful for such an undertaking. Two models will now be introduced, related empirical evidence presented and their relevance for the exploration of PP will be discussed. Subsequently, findings will be linked to existing literature in the perinatal population.

A Theoretical Model of Psychosis

Theories of psychosis have suggested that positive symptoms such as hallucinations and delusions exist on a spectrum within the general population, from no psychotic experiences through to clinical levels of psychosis (Johns & van Os, 2001). Such accounts have been supported by empirical findings, as psychotic-like experiences (PLEs), which are broadly defined as non-clinical experiences of hallucinations or delusions, are frequent (7.2 % in the general population (Linscott & van Os, 2013)) and linked to an increased risk of psychosis (Kaymaz et al., 2012).

The Cognitive Model of Psychosis (Garety et al., 2001) – incorporating the idea of a spectrum – posits that an individual's appraisals of external events are key mediators in determining the outcome of PLEs. Thus, PLEs do not necessarily translate into psychosis

associated with distress, negative impact on day-to-day functioning and a need for clinical support unless they are appraised in a maladaptive way.

Accordingly, research in the general population has shown that distress is linked to appraisal of PLEs, rather than just the experience of PLEs (Lovatt et al.,2010). Specifically, individuals who appraise unusual experiences as externally caused, personally significant and threatening are thought to be at risk of psychosis (Garety et al., 2001; Ward et al., 2014; Yung et al., 2006). For example, Chadwick and Birchwood (1994) have found that appraisals (e.g. beliefs about the omnipotence of a voice) of an event (e.g. hearing a voice) drive distress. On the contrary, non-clinical samples (adults in the general population experiencing persistent PLEs without a need for care) tend to provide normalising and supernatural explanations of PLEs (Brett et al., 2014). Appraisals of unusual experiences, i.e. PLEs, are therefore a deciding factor in distinguishing individuals who need care from those who do not (Peters et al., 2017).

PLEs and their Appraisals in Perinatal Populations

As presented above, studying PLEs in non-clinical populations has been used to support the corroboration of aetiological models of psychosis (Preti et al., 2012). Given that multiple features of PP such as unpredictability, heterogeneity and low prevalence make research on risk factors difficult, this approach has also been used in perinatal populations. To the author's knowledge, three studies have investigated PLEs in pregnant and postpartum women finding contradictory results. Two studies found that levels of delusional ideation in 316 perinatal women (MacKinnon et al., 2017) as well as both delusional ideation and hallucinatory experiences in 103 perinatal women (Mannion & Slade, 2014) were lower than in the general non-clinical population. However, Holt et al. (2018) found that in a large community sample of 1393 postpartum women 93.5% reported experiencing at least one

PLE, concluding that PLEs in the postpartum period might be higher than previously thought and exceed rates found in the general population.

When exploring the mechanisms underlying PLEs, Holt et al. (2018) found that post-traumatic stress symptoms directly predicted the occurrence of PLEs in general and a negative birth experience directly predicted delusions, but not hallucinations. Trauma appraisals and poorer adjustment to motherhood indirectly predicted PLEs, which was a relationship mediated by disturbed self-concept clarity (i.e. the extent to which a person's beliefs about themselves are well-defined, confidently held, coherent and stable). Mannion and Slade (2014) showed that during pregnancy, depressive symptomatology predicted delusions prenatally and hallucinations postnatally. Similarly, MacKinnon et al. (2017) found that psychosocial risk, prenatal anxiety and depressive symptomatology were linked with delusional ideation. So far, no published research has explored the role of appraisals of PLEs – thought to be a key factor in the development and maintenance of psychosis in the general population – and associated distress in the perinatal period.

As mentioned, in addition to the Cognitive Model of Psychosis and the role of appraisals of unusual experiences, drawing on a theoretical model of BD was further thought to be helpful. Such a model, providing a theoretical basis to explore additional psychological processes underpinning PP, will be introduced in the following section.

A Theoretical Model of Bipolar Disorder

The Integrative Cognitive Model of Mood Swings and Bipolar Disorder (ICM; Mansell et al., 2007) offers a comprehensive account of BD, and was chosen to inform the design of the present study as it is thought to represent a psychological construct that integrates various theoretical approaches to BD (see Kelly et al. (2017) for a review).

The theory posits that extreme negative and positive appraisals of internal states are of great importance across the spectrum – from nonclinical to clinical populations – of mood

swing difficulties. Such appraisals of changes in mood states (e.g. happy), cognitions (e.g. racing thoughts), behaviours (e.g. speaking fast) and physiological arousal (e.g. being energetic) are considered maladaptive not because they are incorrect, but because even small, vague changes in internal states (e.g. a short burst of energy) may be appraised in these extreme ways (Kelly et al., 2017). Subsequently, this may lead to attempts to alter, enhance or control internal states, contributing to further mood dysregulation and associated behavioural responses opening up a 'vicious cycle' that maintains and worsens symptoms (Mansell et al., 2007, p.517).

Empirical evidence, applicable to the link between extreme appraisals of internal states and the bipolar spectrum, has been found in a wide range of studies including the investigation of non-clinical samples displaying high risk behaviours (Dempsey et al., 2011), familial risk (Jones et al., 2006) and among those with a diagnosis of BD (Kelly et al., 2011).

Given the argument that PP is likely to be an overt presentation of BD (Sit et al., 2006) and the strong links between BD and PP in terms of a range of factors including vulnerability, recurrence, mania as an early and core symptom, longitudinal outcomes and family history (Chaudron & Pies, 2003), it can be hypothesised that extreme appraisals of hypomania-relevant experiences such as thought racing or feelings of energy, play a role in the development and maintenance of PP. However, so far, no quantitative studies have investigated the link between experiences of hypomania and psychosis or PLEs in perinatal women. Also, there has not yet been any research on appraisals of internal states, potential links to PLEs and distress within the perinatal population, hence, so far it is unknown whether extreme positive appraisals of hypomania-relevant internal states confer vulnerability to PP over and above their known link with (hypo)mania in the general population.

Aims and Hypotheses of the Present Study

First, the aim of this study was to examine whether PLEs, (hypo)manic symptoms and distress are associated during the perinatal period. Second, a further aim was to investigate the role of appraisals related to these experiences including appraisals of internal states, considered to be relevant for the development of mania (see above), and appraisals of external events, thought to be of importance in the experience of distress associated to PLEs (see above).. Findings will increase understanding of relevant cognitive processes in PP and thereby help to not only inform the development of corresponding therapeutic approaches, but also allow further exploration, contributing to improved identification of women at risk of PP and the development of effective screening tools. Based on the above discussed models and empirical evidence, the following hypotheses were formulated:

H_1. Reports of (hypo)mania and PLEs in pregnant women and in the perinatal period will correlate positively.

H_2. Extreme appraisals of internal states will be positively associated with reports of (hypo)mania in the perinatal period.

H_3. PLEs will be positively associated with distress, biased appraisals of external events and extreme appraisals of internal states.

H_4. Appraisals of external events and internal states will mediate the relationship between PLEs and distress.

Method

Participants

Participants were recruited through social media platforms between 17th September 2020 and 30th November 2020. Inclusion criteria were being aged ≥ 18, pregnant in the second or third trimester or being the biological mother of a child under the age of one. Information on pregnancy and motherhood was based on self-report. The total final sample

consisted of 403 women in the perinatal period, including 300 new mothers and 103 pregnant women, who filled in the entire survey. 784 people accessed the online survey, however, 64 participants exited the survey when being asked for consent, 100 participants provided consent but did not go on to fill in any measures, and 215 responses were incomplete. Data from two participants were removed as they reported being pregnant in the first trimester, which was an exclusion criteria.

Demographic and obstetric information is displayed in Table 1. The majority of the sample were White British, married or in a co-habiting relationship, highly educated and reported not having a religion. 35.2% of the sample stated that they had received a mental health diagnosis at some point in their lives. These rates are consistent with data published in the Adult Psychiatric Morbidity Survey (McManus et al., 2016) with a third of women (34.5%) reporting a diagnosis of a common mental health disorder confirmed by a professional. 15.3% of new mothers participating in this study reported postpartum mental health difficulties, which is slightly above lifetime prevalence reported elsewhere. For instance, it has been estimated that between 11% and 13% of women experience depression and anxiety during the perinatal period (Howard et al., 2014).

Using chi-squared tests, there were no significant differences in age ($\chi2(3) = 2.26$, $p = 0.521$), ethnicity ($\chi2(9) = 12.44$, $p = 0.19$), religion ($\chi2(7) = 2.15$, $p = 0.951$), education ($\chi2(3) = 2.88$, $p = 0.41$), marital status ($\chi2(3) = 1.42$, $p = 0.698$) and mental health diagnoses ($\chi2(2) = .79$, $p = 0.675$) between pregnant women and new mothers. Comparing participants who completed the full dataset with those who did not, no significant differences in terms of ethnicity ($\chi2(11) = 11.261$, $p = 0.422$), religion ($\chi2(8) = 15.336$, $p = 0.053$), number of previous children ($\chi2(4) = 9.009$, $p = 0.061$) and mental health diagnoses ($\chi2(2) = 3.603$, $p = 0.165$) were found. However, women who did not complete the survey were younger than those who did

($\chi2(3) = 13.543$, $p = 0.004$) and had lower levels of educational attainment ($\chi2(4) = 14.760$, $p = 0.005$).

Table 1

Demographic and Obstetric Information

Demographic variable	All participants (n=403)	Pregnant women (n=103)	New mothers (n=300)
Age			
18 – 24 years	16 (4%)	6 (5.8%)	10 (3.3%)
25 – 34 years	248 (61.5%)	63 (61.2%)	185 (61.7%)
35 – 44 years	136 (33.8%)	34 (33.0%)	102 (34.0%)
45 – 54 years	3 (.7%)	0 (.0%)	3 (1.0%)
Ethnicity			
Asian British	2 (.5%)	0 (.0%)	2 (.7%)
Asian Pakistani	1 (.2%)	1 (1.0%)	0 (.0%)
Black African	1 (.2%)	0 (.0%)	1 (.3%)
Black British	1 (.2%)	0 (.0%)	1 (.3%)
Black Caribbean	2 (.5%)	0 (.0%)	2 (.7%)
Mixed	8 (2.0%)	1 (1.0%)	7 (2.3%)
White British	320 (79.4%)	75 (72.8%)	245 (81.7%)
White Other	59 (14.6%)	22 (21.4%)	37 (12.3%)
Other	7 (1.7%)	3 (2.9%)	4 (1.3%)
Prefer not to say	2 (.5%)	1 (1.0%)	1 (.3%)
Religion			
Buddhism	3 (.7%)	1 (1.0%)	2 (.7%)
Christianity	111 (27.5%)	30 (29.1%)	81 (27.0%)

Hinduism	1 (.2%)	0 (.0%)	1 (.3%)
Islam	6 (1.5%)	2 (1.9%)	4 (1.3%)
Judaism	2 (.5%)	0 (.0%)	2 (.7%)
Other	2 (.5%)	1 (1.0%)	1 (.3%)
No religion	274 (68.0%)	68 (66.0%)	206 (68.7%)
Prefer not to say	4 (1.0%)	1 (1.0%)	3 (1.0%)
Education			
Primary school	0 (.0%)	0 (.0%)	0 (.0%)
Secondary school	14 (3.5%)	1 (1.0%)	13 (4.3%)
Further education (e.g. technical/clerical)	60 (14.9%)	16 (15.5%)	44 (14.7%)
University	323 (80.1%)	85 (82.5%)	238 (79.3%)
Prefer not to say	6 (1.5%)	1 (1.0%)	5 (1.7%)
Marital status			
Single	33 (8.2%)	8 (7.8%)	25 (8.3%)
Married, or in a cohabiting partnership	366 (90.8%)	95 (92.2%)	271 (90.3%)
Divorced	2 (.5%)	0 (.0%)	2 (.7%)
Separated	2(.5%)	0 (.0%)	2 (.7%)
Prefer not to say	0 (.0%)	0 (.0%)	0 (.0%)
Stage of pregnancy			
Second trimester	N/A	52 (50.5%)	N/A
Third trimester		50 (48.5%)	
Prefer not to say		1 (1.0%)	
Mode of delivery	N/A	N/A	

Caesarean section			96 (32.0%)
Vaginal delivery			204 (68.0%)
Experience of birth	N/A	N/A	
Positive			128 (42.7%)
Negative / traumatic			33 (11%)
Neutral			6 (2.0%)
Mixed (both positive and negative)			133 (44.3%)
Mental health difficulties after birth	N/A	N/A	
Yes			46 (15.3%)
Postpartum depression			27 (9.0%)
Postpartum psychosis			1 (0.3%)
Postpartum anxiety			8 (2.7%)
Postpartum PTSD			3 (1.0%)
Not specified / Other			7 (2.3%)
No			249 (83.0%)
Prefer not to say			5 (1.7%)
Mental health diagnosis (previous or current)			
No	257 (63.8%)	62 (60.2%)	195 (65.0%)
Prefer not to say	4 (1.0%)	1 (1.0%)	3 (1.0%)
Yes	142 (35.2%)	40 (38.8%)	102 (34%)
Anxiety Disorder	25 (6.2%)	9 (8.7%)	16 (5.3%)
Depression	24 (6.0%)	2 (1.9%)	22 (7.3%)

Eating Disorder	2 (0.5%)	1 (1.0%)	1 (0.3%)
PTSD	1 (0.2%)	0 (0%)	0 (0%)
Personality Disorder	2 (0.5%)	0 (0%)	2 (0.7%)
Postpartum mental health diagnosis only	11 (2.7%)	5 (4.9%)	6 (2.0%)
Anxiety Disorder and Depression	28 (6.9%)	11 (10.7%)	17 (5.7%)
Depression and PTSD	1 (0.2%)	0 (0%)	1 (0.3%)
Anxiety Disorder and PTSD	3 (0.7%)	0 (0%)	1 (0.3%)
Personality Disorder and PTSD	1 (0.2%)	0 (0%)	1 (0.3%)
Depression and Eating Disorder	4 (1.0%)	2 (1.9%)	2 (0.7%)
Three or more diagnoses*	21 (5.2%)	5 (4.9%)	16 (5.3%)
Diagnoses not specified	20 (5.0%)	5 (4.9%)	15 (5.0%)

Power Analysis

A-priori sample size was calculated based on planned analytic strategy (see below for details) of correlation, multiple regression and mediation analysis to test the stated hypotheses. First, power analysis was conducted for correlational analysis drawing from a study (Mannion & Slade, 2014) investigating PLEs in pregnant/postpartum women without a history of mental health difficulties using a similar methodology and analysis to the one proposed by this study. Powering for correlational analysis with a moderate effect size (r=0.3), as found in the aforementioned study, a minimum sample size was estimated to be a total of 67 participants. Second, power analysis for multiple regression and mediation

analysis was based on the linear multiple regression model using a small effect size (f2) of .02 and a medium effect size (f2) of .15, an alpha of .05, a standard power level of .80, 1 tested predictor and 3 total predictors. Results showed that for a small effect size a minimum of 395 participants would be needed and for a medium effect size a minimum of 51 participants would be needed to achieve appropriate power levels for this study. As no similar studies had been undertaken previously to inform these power calculations, a cautious approach was taken, and a sample was recruited based on the results for a small effect size. This study sample (n = 403) therefore met the minimum required sample size for adequate power.

Measures

Demographic and Obstetric Information. Demographic information was collected including age, ethnic background, educational attainment, employment status, marital status, religion, and history of mental health difficulties. Obstetric information collected from pregnant women included the stage of their pregnancy (i.e. trimester) and number of previous children. Obstetric information collected from new mothers included mode of delivery, subjective birth experience, perinatal mental health difficulties related to this birth and number of previous children.

Delusional Experiences: Peters Delusions Inventory (PDI-21; Peters et al., 2004). The PDI-21 is a widely used 21-item self-report measure designed to assess delusional ideation, consisting of an unusual belief or thought, including associated distress, conviction and preoccupation in both clinical and non-clinical samples. In this study, the PDI-21 was used to collect data on PLEs, specifically the experience of delusions.

Four scores are added up to obtain an overall total score ranging from 0 to 336, with a higher score representing increased presence and negative impact of delusional ideation. Peters et al. (2004) reported good reliability ($\alpha = 0.82$) as well as high construct and criterion

validity. The PDI-21 has been used previously to assess PLEs in non-clinical perinatal populations with good internal consistency (α = 0.70-0.72, Mannion & Slade, 2014; α =0.73., Holt et al. 2018). Cronbach's alpha for the overall scale assessing delusional ideation was 0.69, indicating acceptable internal consistency. There were not sufficient items in the subscales assessing distress, conviction and preoccupation to assess internal consistency.

Hallucinatory Experiences: Launay–Slade Hallucination Scale-Revised (LSHS-R; Bentall and Slade, 1985). The LSHS-R is a 12-item scale of hallucination proneness in non-clinical populations. For this study, the LSHS-R was used to collect data on hallucinations experienced by the sample.

Each item is rated on a 5-point scale (0 = certainly does not apply to you, 4 = certainly does apply to you). Hence, total scores range from 0 to 48, with higher scores indicating greater proneness to experience hallucinations. Its test-retest reliability has been found to be high (r =0.81; Aleman et al., 1999). The LSHS-R has been utilised in perinatal populations in which it was observed to have acceptable internal consistency (α = 0.73, Mannion & Slade, 2014; α = 0.73, Holt et al., 2018). Cronbach's alpha for the scale was 0.82, indicating a high level of internal consistency.

Mania and Hypomania: Altman Mania Rating Scale (AMRS; Altman et al. 1997). The AMRS was designed to measure the presence and severity of (hypo)manic symptoms for research and clinical purposes. For this study, data collected using the AMRS will be referred to as (hypo)mania within the sample.

It is comprised of five items scored on a 5-point severity scale and has been widely used and well-validated in bipolar disorder populations in a range of settings. It is suitably worded for use during pregnancy and in the postpartum (Altman et al. 2001), and has been used in these populations (Heron & Oyebode, 2011). A threshold of 6 or above is used to indicate the presence of hypomania or mania with higher scores indicating greater severity

of manic symptoms. In the current study, Cronbach's alpha was 0.47, indicating questionable internal consistency, however, such a low alpha score can be explained by very low overall variance of item scores and a relatively small number of items comprising the scale, which lowered correlations between items and therefore the estimate of alpha (Pike & Hudson, 1998; Tavakol & Dennick, 2011). Low variance may be explained by the homogenous nature of the sample and the design of the measure itself: a score of 6 out of a potential total score of 30 is thought to indicate hypomania, hence answering with any variation in the Likert scale indicates hypomania which can be thought of as not representative for the majority of a non-clinical sample.

Appraisals of Internal States: Hypomania Interpretations Questionnaire (HIQ-10, Jones et al., 2006). The HIQ-10 assesses positive self-referent appraisals of mood swings. It is a 10-item scale which asks participants to rate positive self-appraisals (subscale HIQ-H) and normalising appraisals (subscale HIQ-N) of the same hypomania-relevant experience. The HIQ does not assess negative appraisals of internal states. For the purposes of this study, data collected using the HIQ-10 will be referred to as appraisals of internal states.

Appraisals are endorsed from A = 'Not at all' to D = 'A great deal'. For example, 'If my thoughts were coming so thick and fast that other people couldn't keep up, I would probably think it was because...'; 'I am full of good ideas and others are too slow' (HIQ-H); and 'There are too many demands on my time' (HIQ-N). Higher scores represent a stronger belief in specific types of appraisals.

Additionally, participants are asked to indicate whether they had these experiences in the preceding three months (subscale HIQ-E). Higher scores indicate more hypomanic symptoms have been experienced in the last three months. Cronbach's alpha for the entire scale was .79, indicating good internal consistency.

Appraisals of Unusual Experiences: Cognitive Biases Questionnaire for Psychosis (CBQp, Peters et al., 2014). The CBQp is composed of 30 scenarios describing commonplace situations asking participants to imagine them and to choose one of three options describing most accurately how they might think about the situation. Each statement is scored according to a 3-point scale (1 = absence of bias; 2 = presence of bias with some qualification; and 3 = presence of bias). Scenarios are equally divided into two separate constructs: anomalous perceptions (AP) and threatening events (TE) with a maximum total score for each theme of 45. While the CBQp is also split into five cognitive biases subscales (jumping to conclusions, catastrophising, dichotomous thinking, intentionalising, emotional reasoning), they do not appear to be independent, suggesting that the CBQp measures general thinking biases in relation to the two themes rather than distinctive cognitive patterns (Peters et al., 2014) and have been hypothesised to drive threat-based appraisals (Underwood et al., 2016), which is why cognitive biases are not assessed separately in this study and only data on appraisals were used. The data collected using the CBQp will be referred to as appraisals of external events.

The CBQp showed high internal consistency (Cronbach's alpha, a=0.89) and test-retest reliability (r=0.96). In the current study, Cronbach's alpha for the entire scale was 0.34, indicating questionable internal consistency. Reliability analysis showed that the removal of several items resulted in a decrease of alpha and they were removed in a step-by-step process in the following order: Item 13, item 9, item 26, item 29, item 4, item 17, item 27, and item 16. This led to the reduced scale reaching low, but acceptable internal consistency, $\alpha = 0.69$.

Distress: 21-item Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a 21-item self-report measure assessing anxiety, depression and stress over the past week, with higher scores indicating greater difficulties. In this study,

the overall score was used to measure distress. It has outstanding psychometric properties and demonstrated convergent validity (Lovibond & Lovibond, 1995). It has been recommended for use in perinatal populations (Miller et al., 2006). Cronbach's alpha for the entire scale was .94, indicating very good internal consistency.

Procedure

Women who self-identified as being in the perinatal period accessed an online survey by following a link that was included in social media posts, mainly on Facebook groups with the themes pregnancy, motherhood and/or parenthood. They were then redirected to the digital software platform Qualtrics (Provo, UT) where they could fill in the survey using mobile devices or a computer. Prior to participation they were presented with an information sheet (Appendix D) and were asked to complete an online consent form (Appendix E). If consent was given, they were asked to complete the above presented measures in this order: demographic and obstetric information, LSHS-R, PDI-21, DASS21, CBQp, HIQ-10, AMRS (all measures are available to view in Appendix G). When completing or exiting the survey, participants were presented with a debrief statement (Appendix F). All participants had the option of being entered into a prize draw to win one of two £50 shopping vouchers as a small contribution for their time.

Piloting and Ethics

The survey was piloted with eight pregnant and postpartum women to gather feedback and solve potential problems with the online survey. Women took an average completion time of 35 minutes. Amendments based on their recommendations regarding grammatical structure, clarifications and presentation were implemented. Two women felt that items in the CBQp and PDI-21 were largely irrelevant to their experiences and one woman felt that it would have been positive to be asked additional open questions about the quality of her experience of pregnancy. However, given the aim of the study and the

assumption of a continuum of PLEs, with some participants naturally not identifying with items measuring PLEs, measures were not changed.

Ethical approval for the study (Project ID 2159) was granted by the Research Ethics Committee of Royal Holloway, University of London via the full ethical review process (see Appendix B).

Statistical Analysis

Statistical analyses were conducted using the statistical package IBM SPSS Statistics version 25. Data was screened for normality and descriptive statistics were computed for demographic and obstetric variables. None of the variables measured, including entire scales and subscales, were normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$) and it was found that DASS21, PDI-21, HIQ-N, HIQ-H and AMRS variables were positively skewed ($z > 2.58$), while LSHS-R, CBQp and HIQ-E variables were negatively skewed ($z < -2.58$). Subsequent winsorizing of outliers and log10 transformations failed to achieve normality. Bootstrapping with parametric tests was therefore employed. 1,000 bootstrapped samples were used, as this number has been recommended as a robust method of analysis allowing for non-normal distributions and outliers (Field, 2013). Confidence intervals were set at 95% with statistical significance reaching the $p < .05$ level, when the range between the upper and lower level confidence intervals did not cross zero.

To investigate the relationships between (hypo)mania and PLEs (H_1) as well as (hypo)mania and appraisals of internal states (H_2) Pearson's product-moment correlations were conducted, and both *p*-values and Bootstrapped 95% Confidence Intervals (BCa 95% CI) were reported. Correlation coefficients were used to interpret effect sizes using the following convention: ±.1 signifying a small effect, ±.3 a medium effect and ±.5 a large effect (Cohen, 1992). The exploratory nature of the current study has implications for multiplicity

corrections and Bonferroni corrections were employed to control for the increased likelihood of Type I error (Bender & Lange, 2001).

Before running multiple mediation analyses to assess H_3 and H_4, linear regression was employed to assess relationships between demographic and obstetric variables and main study variables in order to statistically screen for potential confounding variables. As demographic data was collected using categorical variables with several categories, dummy variables for age, ethnicity, educational attainment, marital status, religion, mode of delivery, birth experience, previous mental health difficulties and perinatal mental health difficulties were created. It was found that, in fact, there were significant relationships between previous mental health difficulties and perinatal mental health difficulties and PLEs. Hence, these variables were controlled for in the following analysis.

Multiple mediation analyses (Hayes, 2017) using the PROCESS SPSS Macro version 3.5.3, model 4,were conducted to explore whether the relationships between PLEs, both delusional ideation and hallucinatory experiences, and distress were mediated by appraisals of external events and/or appraisals of internal states. Multiple mediation analysis was considered preferable than multiple single mediation analyses allowing for competing theories to be "pitted against each other" (Hayes, 2009, p. 415), thereby making it possible to draw conclusions about the extent of a mediator's effect taking other mediators' influence into account. Preacher & Hayes (2008) advise using 5,000 bootstrap samples and to establish significance of indirect effects when the macro generated bias-corrected bootstrapped 95% CIs do not include zero. This approach was utilised in the current study.

Results

Descriptive Statistics

Descriptive statistics for main study variables including the rates of PLEs, both delusional ideation and hallucinatory experiences, and scores on (hypo)mania endorsed by

the study sample are presented in Table 2. As variables violated assumptions for parametric tests, Mann-Whitney U tests were run to determine if there were differences in rates of PLEs and (hypo)mania between perinatal and postnatal women. Distributions of scores for perinatal and postnatal women were similar, as assessed visually. PDI scores (U = 14.8, z = -0.643, p = 0.520) and LSHS scores (U = 16.016, z = 0.555, p = 0.579) were not significantly different between pregnant women and new mothers. These findings were different to those in other perinatal samples, where it was found that PLEs were higher prenatally than postnatally (MacKinnon et al., 2017; Mannion & Slade, 2014). However, AMRS scores were significantly different between prenatal and postnatal women with pregnant women reporting slightly higher numbers of manic symptoms than new mothers (U = 13.253, z = -2.186, p = 0.029). These findings were in contrast to existing research, as hypomania scores have consistently been found to be higher in the postpartum period (Heron et al., 2009; Heron & Oyebode, 2011; Inglis et al., 2014), however, these studies collected data days or weeks after childbirth making them not comparable to the current study which used data collected up to one year postpartum.

Table 2

Mean Scores for Measures of PLEs and (Hypo)mania

Variable	Prenatal Mean (SD)	Postnatal Mean (SD)	Perinatal total Mean (SD)	Variable range *Study range*	Comparative community norms
PDI-21	3.28 (2.46)	3.18 (2.60)	3.21 (2.56)	0-21 *0-12*	5.4 (S.D.= 3.6)[a]
LSHS-R	34.83 (7.95)	35.30 (8.11)	35.18 (8.06)	0-48 *0-48*	20.19 (*SD*= 2.98)[b]
AMRS	2.91 (2.56)	2.35 (2.37)	2.49 (2.43)	0-25 *0-13*	3.31 (C.I. 2.9–3.7)[c]

[a] (Rodier et al., 2011)
[b] (Fonseca-Pedrero et al., 2010)
[c] (Jones et al. 2005)

Table 3 presents descriptive statistics for the remaining study variables.

Table 3

Mean Scores for Measures of Biased Appraisals of External Events, Appraisals of Internal States and Distress

Variable	Prenatal Mean (SD)	Postnatal Mean (SD)	Perinatal total Mean (SD)	Variable range Study range	Comparative community norm (SD)
CBQp-TE	23.73 (2.82)	23.61 (2.74)	23.64 (2.76)	11-33* 11-29	19.0 (1.7)[a]
CBQp-AP	24.76 (2.51)	24.75 (2.26)	24.75 (2.32)	11-33* 11-29	17.5 (1.6)[a]
HIQ-N	24.74 (4.67)	24.61 (4.75)	24.64 (4.73)	10-40 11-37	24.61 (4.87)[b]
HIQ-H	18.19 (5.07)	18.25 (4.99)	18.24 (5.00)	10-40 10-34	22.29 (5.78)[b]
DASS21	15.98 (10.24)	17.97 (11.93)	17.46 (11.54)	0-68 0-57	9.4 (9.7)[c]

*Variable range has been adjusted according to Cronbach alpha corrections.
[a] (Peters et al., 2014)
[b] (Johnson & Jones, 2009)
[c] (Henry & Crawford, 2005)

Mann-Whitney U tests showed that there were no significant differences between prenatal and postnatal women on HIQ-H (U = 15.52 , z = .115, p = .908), HIQ-N (U = 15.31 , z = -.134, p = .893), DASS21 (U = 16.77, z = 1.293, p = .196), CBQp-AP (U = 15.94 z = -.254, p = .799) and CBQp-TE (U = 14.85, z = -.591, p = .555).

Hypotheses Testing

H_1. Reports of (hypo)mania and PLEs in the perinatal period will correlate positively.

A Pearson's product-moment correlation with bootstrapping was run to explore H_1. Tested against Bonferroni corrected p-values (p =.025)**,** there were no statistically significant correlations between (hypo)mania and hallucinatory experiences (r =.007, p = .896, BCa 95% CI [-.138, .133]) supported by p-values and bootstrapped confidence intervals.

Table 4

Pearson Correlations for PLEs and (Hypo)mania

Group	Hallucinatory experiences (LSHS)			Delusional beliefs (PDI)		
	r	p	BCa 95% CI	r	p	BCa 95% CI
Perinatal women (n = 403)	.007	.896	[-.138, .133]	.095	.057	[-.180, -.011]
Pregnant women (n = 103)	-.149	.133	[-.427, -.167]	-.113	.255	[-.062, .176]
New mothers (n = 300)	.066	.254	[-.062, .176]	-.092	.114	[-.190, .020]

*p < .05. **p < .01, *** p < .001

There was no statistically significant correlation supported by p-value between (hypo)mania and delusional beliefs (r = -.095, p = .057, BCa 95% CI [-.180, -.011]), however, given that BCa 95% did not cross zero there is an increased likelihood of erroneously accepting the null hypothesis (Hoekstra et al., 2012), thereby potentially overlooking a significant negative relationship with a small effect size between delusional ideation and hypomania. However, given the need for corrections due to multiple analyses, this explanation would seem unlikely. Table 4 shows correlations between PLEs and (hypo)mania in pregnant women and new mothers. H_1 was not supported.

H_2. Extreme appraisals of internal states will be positively associated with reports of (hypo)mania in the perinatal period.

A Pearson's product-moment correlation with bootstrapping was run to assess H_2. Table 5 shows correlations between appraisals of internal states and (hypo)mania in pregnant women and new mothers.

Table 5

Pearson Correlations for Appraisals of Internal States and (Hypo)mania

Group	Positive self-appraisals (HIQ-H)			Normalising appraisals (HIQ-N)		
	r	p	BCa 95% CI	r	p	BCa 95% CI
Perinatal women (n = 403)	.296**	< .001	[.206, .390]	-.116*	.020	[-.192, -.039]
Pregnant women (n = 103)	.237*	.016	[.099, .375]	-.232*	.018	[-.362, -.090]
New mothers (n = 300)	.322**	< .001	[.211, .434]	-.077	.183	[-.175, .019]

*p < .05. **p < .01, *** p < .001

Using Bonferroni corrected p-values (p =.025)**,** there was a statistically significant, medium positive correlation between positive self-appraisals (HIQ-H) and (hypo)mania (AMRS) (r =.296, p < .001, BCa 95% CI [.206, .390]) and a statistically significant, small negative correlation between normalising appraisals (HIQ-N) and (hypo)mania (AMRS) (r =.116, p = .02, BCa 95% CI [-.192, -.039]) supported by p-values and bootstrapped confidence intervals. H_2 was supported.

H_3. PLEs will be positively associated with distress, biased appraisals of external events and extreme appraisals of internal states.

and

***H_4. Appraisals of external events and internal states will mediate the relationship between PLEs and distress*.**

Multiple mediation analyses were conducted to assess H_3 and H_4. CBQp-TE scores, CBQp-AP scores and HIQ-H scores were entered simultaneously into the model as potential mediators between PLEs (LSHS-R and PDI-21) and distress (DASS21), whilst controlling for previous and current mental health difficulties. Visual representations of the model are

shown in Figure 1 and Figure 2, along with the regression coefficients and corresponding *p*-values for each path.

Direct Effects. Table 6 shows the results for regression coefficients, standard errors and significance values, for the relationships between PLEs (X) and mediators (M1, M2 and M2), the relationship between mediators (M1, M2 and M3) and distress (Y) and direct (path c') and total effects (path c) between PLEs (X) and distress (Y).

Considering $H_{3,}$ the regression coefficients detailed in Table 6 and 7 indicate that:

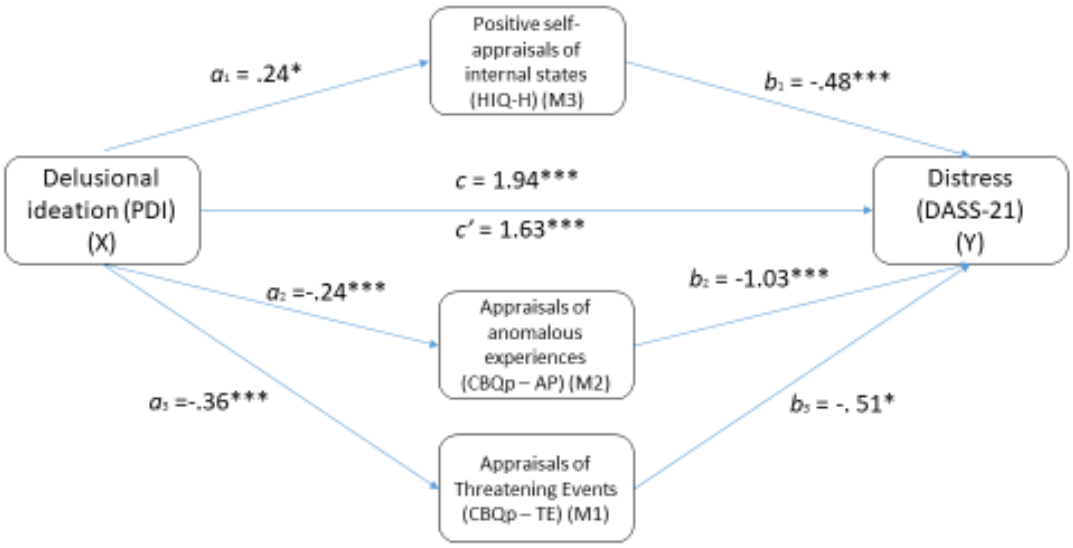
(1) As hypothesised, more frequent experiences of delusional ideation significantly predicted distress, however, contrary to what had been hypothesised, more frequent experiences of hallucinations were a significant negative predictor of distress.

(2) Biased appraisals of threatening events and anomalous experiences as well as positive self-appraisals of internal states negatively predicted distress.

(3) More frequent experiences of hallucinations were associated with higher rates of biased appraisals of external events, however, they were not significantly associated with higher rates of positive self-appraisals of internal states. More frequent experiences of delusional ideation, however, were negatively associated with higher rates of biased appraisals of external events, but positively associated with higher rates of positive self-appraisals of internal states.

Figure 1

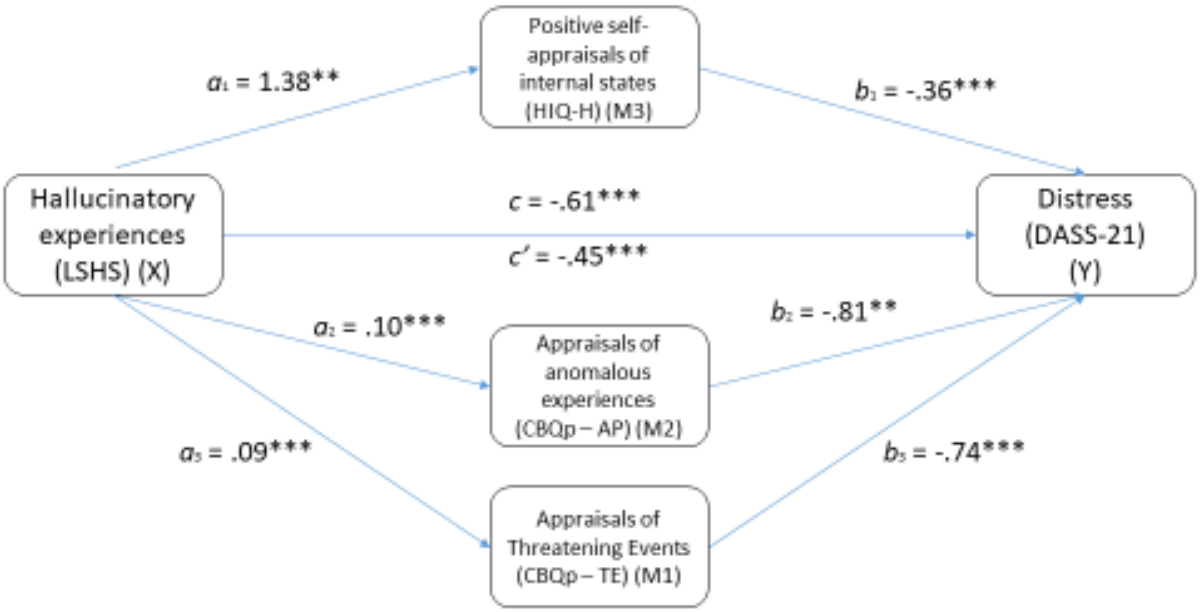
Multiple Mediation Analysis of the Effect of Delusional Ideation on Distress, Mediated by Appraisals of External Events and Internal States



Significant regression coefficients: *p < .05, **p < .01, ***p < .001

Figure 2

Multiple Mediation Analysis of the Effect of Hallucinatory Experiences on Distress, Mediated by Appraisals of External Events and Internal States



Significant regression coefficients: *p < .05, **p < .01, ***p < .001.

Table 6

Hallucinatory Experiences: Results of Multiple Mediation Analysis (Direct Effects)

	Consequent											
	DASS21 (Y)			CBTp-TE (M1)			CBTp-AP (M2)			HIQ-H (M3)		
Antecedent	b	*SE*	*p*	b	*SE*	*p*	b	*SE*	*p*	b	*SE*	*p*
Mental health difficulties	-2.68	.98	.007	.43	.27	.106	.48	.22	.029	1.38	.51	.007
LSHS (X)	-.45	.06	<.001	.09	.02	<.001	.10	.01	<.001	.004	.03	.895
CBTp-TE (M1)	-.74	.20	<.001	-	-	-	-	-	-	-	-	-
CBTp-AP (M2)	-.81	.25	.001	-	-	-	-	-	-	-	-	-
HIQ-H (M3)	-.36	.10	<.001									
Regression model	R^2 = .33			R^2 = .09			R^2 = .14			R^2 = .02		
	F(5,397) = 39.50, *p* < .001			*F* (2, 400) = 19.10, *p* < .001			*F*(2, 400) = 33.39, *p* < .001			*F*(2, 400) = 3.84, *p* = .022		

Table 7

Delusional Ideation: Results of Multiple Mediation Analysis (Direct Effects)

	Consequent											
	DASS21 (Y)			CBTp-TE (M1)			CBTp-AP (M2)			HIQ-H (M3)		
Antecedent	b	*SE*	*p*	b	*SE*	*p*	b	*SE*	*p*	b	*SE*	*p*
Mental health difficulties	-1.73	.98	.079	. 25	.27	.357	.45	.23	.053	1.67	.51	.001
PDI (X)	1.63	.20	<.001	-.36	.05	<.001	-.24	.04	<.001	.24	.10	.013
CBTp-TE (M1)	-.51	.20	.013	-	-	-	-	-	-	-	-	-
CBTp-AP (M2)	-1.03	.24	<.001	-	-	-	-	-	-	-	-	-
HIQ-H (M3)	-.48	.10	<.001									
Regression model	R^2 =.35			R^2 = .12			R^2 = .09			R^2 = .03		
	F(5, 397) = 43.37, p < .001			F (2, 400) = 26.99, p < .001			F(2, 400) = 20.19, p < .001			F(2, 400) = 6.97, p = .001		

Indirect Effects. To test the mediation hypothesis (H_4), indirect effects of PLEs (X) on distress (Y) through appraisals (M1, M2 and M3) were explored.

First, rejecting H_4, it was found that mediation occurred in the opposite direction than predicted, showing a negative association between hallucinatory experiences and distress with biased appraisals of threat and anomalous perceptions being significant mediators, as bootstrapped confidence intervals did not cross zero (see Table 8). This means that hallucinatory experiences have an indirect negative effect on distress mediated via their positive link with biased appraisals of external events (paths a_2 and a_3 in Figure 2). Positive self-appraisals of internal states (HIQ-H) were not a significant mediator in the relationship between hallucinatory experiences and distress.

Table 8

Hallucinatory Experiences and Distress: Indirect Effects of Mediators

Variable	Effect	SE	BCa CI [LCI, UCI]
Total	-.152 .	.038	[-.230, -.082]
Mediator			
CBTp-TE	-.069	.026	[-.125, -.025]
CBTp-AP	-.082	.030	[-.144, -.025]
HIQ-H	-.002	.014	[-.033, .023]

Second, results showed significant indirect effects of delusional ideation on distress via the mediators biased appraisals of external events; however, again rejecting H_4, mediation occurred in the opposite direction as predicted. The indirect positive effect of delusional ideation on distress was mediated via negative associations between delusional ideation and biased appraisals of external events (paths a_2 and a_3 in Figure 1) as well as between biased appraisals of external events and distress (paths b_2 and b_3 in Figure 1). Also,

a significant negative indirect effect of delusional ideation on distress mediated via the positive link of delusional ideation and positive self-appraisals (path a_1 in Figure 1) and the negative link between positive self-appraisals and distress (path b_1 in Figure 1) was found. H_4 was not supported.

Implications of these results will be discussed in detail in the following section.

Table 9

Delusional Ideation and Distress: Indirect Effects of Mediators

Variable	Effect	SE	BCa CI [LCI, UCI]
Total	.315	.128	[.082, .583]
Mediator			
CBTp-TE	.182	.081	[.043, .357]
CBTp-AP	.249	.083	[.106, .431]
HIQ-H	-.116	.055	[-.234, -.017]

Discussion

In this final section the study's findings will be summarised and considered within the context of existing research. Then limitations of the present study will be outlined before discussing clinical and theoretical implications and exploring potential avenues for future research. The section will close with concluding remarks.

Overview of Results

The present study aimed to answer three main questions: (1) Are PLEs in the perinatal period linked to (hypo)mania? (2) Are appraisals of internal states linked to (hypo)mania during this time? And, (3) to what extent do appraisals of external events and internal states mediate the relationship between PLEs and distress?

Contrary to what was hypothesised, results indicated that PLEs and (hypo)mania were not associated in the perinatal period, however, as predicted, appraisals of internal mood states were associated with (hypo)mania during this time. Further, it was found that delusional ideation positively predicted distress, while, contrary to what had been hypothesised, hallucinations were a negative predictor of distress. While, as predicted, hallucinatory experiences were associated with higher rates of biased appraisals of external events, surprisingly delusional ideation was negatively associated with higher rates of biased appraisals of external events. Even more surprisingly, biased appraisals of external events as well as positive self-appraisals of internal states negatively predicted distress.

Results in the Context of Previous Findings

(Hypo)mania and Bipolar Disorder have been associated with PP (Di Florio et al., 2018; Robertson et al., 2005), however, neither the occurrence of (hypo)mania nor cognitive styles, such as appraisals of internal mood states, known to be relevant in (hypo)mania have been investigated within the context of PLEs in the perinatal period. Here, whilst a link between (hypo)mania and positive self-appraisals of internal states was found, neither delusional ideation nor hallucinatory experiences were associated with (hypo)mania. Hence, the experience of (hypo)mania and PLEs in the perinatal period may occur independently from each other with a range of determining and maintaining factors potentially unlinked and largely unknown (Heron & Oyebode, 2011). The theoretical basis of the Integrative Cognitive Model of Bipolar Disorder (Mansell et al., 2007) appears to hold true for perinatal women, as it does in the general population (Kelly et al., 2017), however, giving the missing link between PLEs and (hypo)mania, perinatal status may not be of relevance when looking at appraisals of internal mood states and associated difficulties.

To date, two studies have assessed the relationship between Postpartum Psychosis and psychological factors known to be relevant in Bipolar Disorder. Firstly, it was found that

the personality trait neuroticism assessed during pregnancy was not linked to Postpartum Psychosis among a mixed sample of women with schizoaffective disorder and Bipolar Disorder(Marks et al., 1992). Secondly, comparing a range of personality traits, affective temperaments and cognitive styles between women with Bipolar Disorder with and without a history of Postpartum Psychosis, it was found that none of the examined psychological factors differentiated the two groups (Perry et al., 2019). Together with the findings of this study, it can be suggested that psychological factors linked with Bipolar Disorder are unlikely to be specifically associated with vulnerability to and onset of Postpartum Psychosis, which is consistent with findings indicating predominantly biological factors triggering Postpartum Psychosis episodes. For instance, Jones and Craddock (2001) showed women with Bipolar Disorder and a family history of Postpartum Psychosis were at a six-fold greater risk of experiencing Postpartum Psychosis than women with Bipolar Disorder and no family history of Postpartum Psychosis. In addition to potential genetic factors, the temporal link of Postpartum Psychosis with childbirth points towards pathophysiological mechanisms which may be hormonal (Jones & Smith, 2009), inflammatory (Bergink et al., 2013) and/or immunological (Bergink et al., 2011). Also, studies have not found consistent associations between Postpartum Psychosis and other psychosocial factors (e.g. childhood trauma or obstetrical complications (MacKinnon et al., 2017; Perry et al., 2016)). Hence, while positive self-appraisals of internal mood states are associated with vulnerability to (hypo)mania in general, they are unlikely to influence the triggering of an episode of Postpartum Psychosis .

Further, results indicated that the mediation model was not a good fit for the data. Looking at direct effects, it was found that delusional ideation positively predicted distress, however, in contrast to what was expected, hallucinatory experiences were a negative predictor of distress. Findings that delusional ideation is associated with overall distress in perinatal women is supportive of existing evidence in the general (e.g. Saha et al., 2011) and

perinatal population (MacKinnon et al., 2017) as well as during pregnancy (Mannion & Slade, 2014).

A review of 23 studies investigating voice-hearing, the most common type of hallucinations, and distress among individuals without a need for care, all reported that voice-hearing was associated with little to no voice-related distress, and/or that voice distress was significantly lower than in clinical samples (Baumeister et al., 2017). Further, more than 90% of voice hearers in the general population reported no disturbance to their life due to the voices they heard (Sommer et al., 2010). Similarly, this study utilised a non-clinical perinatal sample which may explain the missing link between hallucinatory experiences and distress.

The negative correlations between biased appraisals and distress are perhaps the most surprising findings of this study, as it would have been thought that such links would remain relevant in a non-clinical sample assuming experiences occur on a continuum. These findings were inconsistent with existing research finding validation for relationships between psychotic-like experiences, appraisals and distress. For instance, appraisals of threat have been found to be strongly correlated with delusional ideation (Prochwicz & Kłosowska, 2018; Reininghaus et al., 2016) and threatening appraisals of psychotic-like experienceswere a key factor when linking psychotic-like experiences and clinical outcome (i.e. need for care) (Underwood et al., 2016). Additionally, conviction in normalising appraisal was found to be related to lower levels of overall distress and anxiety in at-risk individuals (Brett et al., 2014).

Limitations

The findings of the present study should be interpreted in the context of some limitations.

Firstly, the use of self-report measures of psychotic-like experiencesand (hypo)mania have shown to identify high numbers of false-positives (Lee et al., 2016; Rucci et al., 2013).

This could be an issue particularly pertinent to the data collected on hallucinatory experiences, and therefore the finding of a missing link between hallucinations and distress, as the scores on the LSHS-R, the measure used to collect data on hallucinatory experiences, in this sample were substantially higher than in previously assessed non-clinical groups (Fonseca-Pedrero et al., 2010). Given the multidimensionality of psychotic-like experiences, self-report tools are based on subjective interpretations that cannot be verified, hence the intended and/or same constructs across participants may not always be captured. Indeed, internal consistency was found to be low on measures of appraisals of psychotic-like experiences. Further, the 'leading' formulations frequently used in self-report measures (i.e. a lot of people report such experiences) has been found to increase rates of false-positives (David, 2010). Such false positives may have contributed to findings leading to the rejection of the mediation model.

Secondly, selection bias could have affected the results of the study. The sample was a self-selecting group recruited through social media sites. Given that the advertisement stated the study was about pregnancy, motherhood and the experience of distress it is possible that it attracted those with such experience.

In fact, reported rates of lifetime and perinatal mental health difficulties were higher than commonly reported prevalence rates (Howard et al., 2014), suggesting the sample was not representative in this respect. It could therefore be hypothesised that high levels of distress were rooted within a range of existing difficulties, such as anxiety or depression. And, importantly, they could be associated with the unprecedented pressures women participating in this study experienced as data was collected during the Covid-19 pandemic. Indeed, a review of 30 studies showed an increase in the prevalence of anxiety and/or depression symptoms, which were associated with the possibility of COVID-19 infection, social isolation, changes in the provision of perinatal care and financial difficulties (Suwalska

et al., 2021). These difficulties were potentially exacerbated and prolonged by limited access to mental health support services during pregnancy and early motherhood during the Covid-19 pandemic, according to a report by the Royal College of Psychiatrists' Mental Health Watch (2021). Hence, the study's results, presenting a missing relationship between psychotic-like experiences and distress, may have been generated by unusually high levels of distress while the presence of psychotic-like experiences remained stable.

Further, the majority of the sample were white women who were highly educated and reported high levels of social support which is not representative of the perinatal population. As such the sample excluded the most vulnerable women who might have responded differently to employed measures potentially leading to different findings than those reported here, as poverty, low educational achievement and discrimination have been found to be associated with psychotic-like experiences in the general population (Loch et al., 2017) Also, high attrition, particularly at the stage of providing consent, was noted. Given that the average drop-out rate from web-based studies was found to be 31% (Melville et al., 2010), attrition in this study was above average. While it was found that younger women with lower educational achievement were more likely to drop out throughout the survey, implications of which have been discussed above, a sizeable number of participants dropped out when seeing the initial information and consent pages, which necessarily preceded any data collection on demographic information. Hence, it was not possible to draw any conclusions about the characteristics of these participants. It may be that when people learned further details of the study, they opted not to take part. Reasons for this are unknown, but it could be hypothesised that women who recognised themselves as experiencing clearly defined psychotic-like experiences did not wish to fill in the survey due to associated stigma (Lien et al., 2015). In the future, similar studies could aim to facilitate face-to-face data collection within community settings in an attempt to reduce distractions

and support those with lower educational achievement to fill in the questionnaire in a timely manner supported by a researcher. Additionally, future studies with more specific research questions – contrary to the explorative nature of this study – may be able to shorten questionnaire batteries, increasing the likelihood of participants completing the entire battery. Hence, generalisability of findings is limited by these factors.

Thirdly, the current study explored psychotic-like experiences, hypomania and appraisals of such experiences across the perinatal period. Descriptive analysis in this study found no difference in rates of PLEs between pregnant women and new mothers, which was in contrast to existing studies where it was found that PLEs were higher prenatally than postnatally (MacKinnon et al., 2017; Mannion & Slade, 2014), however these studies followed participants longitudinally. As demographic factors were similar, differences in findings could be explained by higher numbers of postnatal women than prenatal women in the current study. Future studies could benefit from adopting a longitudinal approach including the assessment of baseline measures before pregnancy by recruiting a sample of women intending to conceive as well as investigating the pre and postnatal period over multiple time points, given that variables measured across the perinatal period or even dichotomously pre and postnatally may not detect variance in processes across the perinatal period and at specific times of high risk for the experience of psychotic-like experiences, (hypo)mania and distress. For instance, it was found that perinatal anxiety was highest in the third trimester of pregnancy (Dennis et al., 2017) and depression was found to be highest in the first three months postpartum (Gavin et al., 2005). Therefore, conclusions which can be drawn from comparing current findings are limited.

Clinical Implications

As 10-20% of women experience mental health difficulties during the perinatal period (Howard et al., 2014), this can be considered a time of high risk. Previous research

has linked psychotic-like experiences with depression, anxiety and suicide in the general population, which has led researchers recommending screening of psychotic-like experiences in clinical work (Kelleher & Cannon, 2016), as the experience of psychotic-like experiences may represent a heightened risk for adverse clinical outcomes (Hodgekins et al., 2018). Findings from the current study showed delusional ideation, but not hallucinatory experiences, increased alongside levels of distress. It could therefore be argued that screening for delusional ideation during this period could be a helpful clinical tool, used alongside existing screening tools, in identifying women at risk of mental health difficulties while considering delusional ideation as both a marker of potential psychopathology and a set of beliefs translating into an unhelpful thinking style. Clinicians would have to ask these questions sensitively, as it has been found that questionnaires identifying women at risk of difficulties are only efficacious if women feel comfortable disclosing difficulties (Howard et al., 2018) and fear around stigmatisation has been particularly high when being asked about PLEs (Lien et al., 2015). Additionally, women in the perinatal period should be made aware by all health professionals supporting them that distress during this time can naturally be high, which does not mean that support should be withheld, and that the experience of psychotic-like experiences is not necessarily a marker of ill mental health.

Findings that biased appraisals of external events did not mediate the association between PLEs and distress as predicted, suggest that interventions targeting such appraisals may not be beneficial in the perinatal population. Given this study did not specifically measure distress related to psychotic-like experiences, above discussed potential consequences of an unrepresentative sample and contrary research findings in the general population (Lovatt et al., 2010; Peters et al., 2017), further research is needed to rule out the role of appraisals completely. Separate symptoms of Postpartum Psychosis, such as mania and psychotic features, are probably influenced by differing processes which calls for

treatment approaches which target specific clinical symptoms rather than adopting diagnosis based models of treatment (Moritz et al., 2017).

Theoretical Implications

The results partly support the existence of a continuum model showing the occurrence of psychotic-like experiences in women without a clinical diagnosis of psychosis. The significant relationship between distress and delusional ideation may further support the notion that such symptomatology exists along the same continuum encompassing psychotic-like experiences in people who present with no levels to significant levels of distress, however, this did not hold true for hallucinatory experiences.

One could say that limited direct effects between psychotic-like experiences and distress are not necessarily at odds with the Cognitive Model of Psychosis (Garety et al., 2001), which hypothesises distress to be due to particular types of appraisal rather than the experience itself. As such, hallucinations, even of negative content, may have a less pronounced direct effect on distress in the general population than delusional ideation. However, delusional ideation, which is inherently a belief and frequently of negative nature as measured in the PDI-21, may in itself carry a value judgment involving feeling under threat or personally targeted. Delusional ideation may therefore be a stronger marker of distress than hallucinations. In clinical or at-risk samples, it has been found that hallucinations can induce the formation of delusions, then thought of as a secondary belief or cognitive appraisals and identified as a psychological mechanism increasing the risk of psychotic onset and, by definition, distress (Krabbendam et al., 2004). The current study, as is the norm in existing research, defined delusional experiences as a measure of psychotic-like experiences (e.g. Preti et al., 2007; Saha et al., 2011), however, using measures of delusional ideation as a cognitive appraisal could highlight mechanisms underlying the link

between psychotic-like experiences and non-psychotic psychological distress (Bell et al., 2006; Krabbendam et al., 2004).

Nevertheless, biased appraisals did not predict distress, which raises questions for the applicability of the Cognitive Model of Psychosis in the perinatal population. It could be possible that inclusion of a clinical or at risk group for PP would have led to different results, as it could be found that psychotic-like experiences and associated appraisals do occur on a continuum that presents with a "cut off" point after which a minority of people experience distress and a need of care. Hence, systematically not including research participants with experiences on the extreme end of the spectrum, is likely to bias results.

Future Research

The current state of knowledge around psychotic-like experiences, underlying mechanisms and distress in the perinatal period has been limited to correlational designs, meaning that causal links have not been established. Future research should consider recruiting 'at-risk' perinatal groups and focus on utilising experimental, prospective and longitudinal designs in order to establish causal relationships between psychotic-like experiences and distress.

To move forward with our understanding of Postpartum Psychosis, case studies could facilitate initial investigations of psychotic symptoms, specific appraisals of particular experiences and associated distress to the individual. It may be beneficial to qualitatively explore the subjective meaning of these appraisals and their relationship to motherhood and the infant to inform future directions of quantitative research on psychological mechanisms underlying Postpartum Psychosis with the aim to develop specific measures and therapeutic approaches for individual symptoms experienced by women at risk of and with Postpartum Psychosis.

Conclusion

Postpartum Psychosis is a mental health disorder which has potentially severe consequences for mother and child. It is therefore vital to continue to explore risk factors and underlying mechanisms of Postpartum Psychosis. This study, which considered the relevance of cognitive appraisals of psychotic-like experiences and (hypo)mania for the experience of distress in a large group of perinatal women, suggests that psychotic-like experiences and (hypo)mania are unrelated and that cognitive appraisals known to be linked to psychotic disorder in the general population may not influence distress during this time and, by way of conclusion, vulnerability to Postpartum Psychosis specifically. Treatment approaches that consider individual symptoms separately may therefore be warranted.

Integration, Impact and Dissemination

This chapter will, first, describe the processes through which the empirical study and systematic review were developed and will offer an integration of their findings even though they were undertaken as two distinct pieces of research. Second, user involvement and feedback from participants regarding the empirical study will be discussed. Third, an overview of the potential impact of both pieces of research on several stakeholders, including women in the perinatal period, people experiencing VH and their families, clinicians and researchers will be provided. Lastly, plans for the dissemination of the findings from the systematic review and empirical study, optimising their impact, will be described.

Integration

The systematic review and empirical study were developed separately and the foci of both pieces of research underwent several changes (as discussed below), which partly explains their outputs on different topics. Nevertheless, the central aim of this thesis was to advance understanding of the experience of positive psychotic symptoms and the psychological processes contributing to them. The systematic review aimed to improve knowledge of the phenomenology of VH while additionally analysing information on VH impact through describing the potential role of appraisals and behavioural responses to the emotional impact of VH. The empirical study tested the relationships between PLEs, (hypo)mania, appraisals of external events and internal states (i.e. mood changes), and distress. Hence, the two elements of this thesis can be linked by their attempt to improve understanding on aspects relevant for the development and treatment of different forms of psychotic illness.

Development of the Empirical Study

The empirical paper was developed on the basis of a clinical interest in perinatal mental health, in particular PP. During initial literature searches, studies that had researched

the occurrence of PLEs in the perinatal period and investigated risk factors and etiological models of PP were identified (Holt et al., 2018; MacKinnon et al., 2017; Mannion & Slade, 2014). The severity and low prevalence rates of PP meant that women with this diagnosis were a group that is difficult and potentially unethical to access as research participants. Therefore, it was thought that an approach utilising PLEs might also be beneficial for this research project. PLEs in non-clinical groups or populations at risk of psychosis have previously been investigated with the aim of corroborating the continuum model (DeRosse & Karlsgodt, 2015) and researching the role of cognitive appraisals in the development and maintenance of psychosis in general (Peters et al., 2014). As it has not been researched whether particular types of appraisals known to be relevant in psychosis (i.e. interpreting unusual experiences as threatening and/or personally significant) could also be relevant in the experience of distress related to PLEs in the perinatal period, it was thought to be an interesting and worthwhile topic on which to develop a detailed proposal for a research project. Additionally, the supervisor for this project had established links with two psychologists working in a perinatal mental health service allowing for the recruitment of women at risk of PP (i.e. a history of BD or previous PP) who had been identified by the service prenatally. A proposal for this study, including a non-clinical and clinical group, had been accepted by Royal Holloway, University of London and study documents such as information sheets and letters for clinicians had been designed and approved. Further, the project plan had been reviewed and approved by an NHS Research Ethics Committee. However, the COVID-19 pandemic and the introduction of strict lockdown measures meant that it was no longer possible to complete the project as planned. Ethical approval had been received under the condition that the researcher would be present to support women from the at risk group in a face-to-face setting and the collaborating psychologists working in a perinatal mental health team felt that the service was likely to experience unprecedented

and unknown pressures, which would make it difficult to facilitate support to complete the research project. Hence, a revised study on similar psychological processes was developed facilitating recruitment and data collection exclusively using online methods and therefore only recruiting a non-clinical group. These changes meant that the study produced interesting findings which explored the relationships between PLEs, appraisals and distress across the perinatal population, advancing the understanding of psychological processes in line with the continuum model of psychosis. However, it is of note that such null results are contradictory to previous findings showing some, albeit not consistent, links between both hallucinatory experiences and delusional ideation and distress (Holt et al., 2018; Mannion & Slade, 2014). Further, the majority of research investigating the role of biased appraisals in the development and maintenance of distress linked to PLEs in clinical samples have reported significant findings (Brett et al., 2014; E. Peters et al., 2017; Ward et al., 2014). Hence, the initial version of this study including a group at risk of experiencing PP may have produced different results.

Development of the Systematic Review

Originally, it was planned to conduct a systematic review more clearly related to the empirical study. Initial searches were carried out on topics such as PLEs in the perinatal period, which did not lead to a sufficient number of articles warranting a review, as well as on the role of appraisals in the relationship between PLEs and distress, which led to identifying too many eligible articles. Further, it was found that similar reviews had been conducted for particular PLEs such as auditory hallucinations in non-clinical populations (Baumeister et al., 2017). In an attempt to streamline the review, appraisals of VH were considered as a potential topic, but surprisingly it was found that VH research has been largely neglected and few articles had been written on the topic of appraisals and few systematic reviews had been completed on VH in general. Hence, the decision was made to

conduct a review that covered phenomenology and impact of VH, as it was thought that this could be a valuable resource for clinicians and a basis for researchers wanting to explore more detailed questions about VH.

Synergy between Systematic Review and Empirical Study

In a wider sense, the joint aim of the systematic review and empirical study was to explore psychological processes contributing to positive symptoms of psychosis, which is where some synergy between the two pieces of research was achieved. However, they each underwent lengthy planning processes, developing in parallel along their own trajectories and establishing specific individual foci. Factors limiting comparability of the presented findings are mostly due to the review and the empirical study focussing on different groups: people with a diagnosis for non-affective psychosis (i.e. clinical samples) and women in the perinatal period (i.e. a non-clinical sample) as well as an exploration limited to VH in the review, compared to people who potentially experience PLEs, including all types of hallucinatory experiences and delusions, in the empirical study.

Nevertheless, some topical overlap between VH, psychotic symptoms, and their impact (i.e. what was referred to as distress in the empirical study) should be discussed. It was found that hallucinatory experiences in perinatal women are a frequent experience, however, they are not significantly linked to distress, which is in contrast to what the review indicated, as participants consistently reported emotional distress linked to their VH. Bearing in mind that the review was not able to establish a quantifiable link between VH and distress, it can be tentatively suggested that the level of distress experienced in a clinical group is likely to be higher than in a non-clinical group. These differences fit within the theoretical framework of the continuum model (Johns & van Os, 2001) highlighting that hallucinations *per se* are not necessarily drivers of distress. This observation, as it has been made many times before, leads to the question of what factors link PLEs and distress. As

explained in both pieces of research, this thesis drew on the Cognitive Model of Psychosis (Garety et al., 2001), positing that appraisals of PLEs determine their impact on the individual. Interestingly, biased appraisals as a mediating factor between PLEs and distress could not be confirmed in the empirical study, whilst the findings of the review suggested that appraisals of VH in a clinical group are of some importance, however, results were merely descriptive. Further questions, which go beyond the scope of this thesis, should be asked: Are there factors other than biased appraisals that distinguish people experiencing distressing PLEs compared from those experiencing non-distressing PLEs? And, are there phenomenological aspects (e.g. content, multimodality) that are linked to higher levels of distress?

The systematic review highlighted the importance of understanding individual psychotic symptoms such as VH as subjective and complex experiences. This is thought to also be important for psychotic symptoms in PP, which for some women include VH, and about which very few details are known (Sit et al., 2006). As with other populations, providing psychoeducation and speaking to them openly about their experiences, acknowledging their potential complexity and impact is crucial.

User Involvement

The process of conducting the empirical paper was informed by direct feedback from women in the perinatal period. Five pregnant women and three new mothers piloted the study and offered feedback on forms and questionnaires. All women made some suggestions on grammar, wording and layout of the study, and changes were made to the online survey. For example, one question said “Is this your first child?”, and two women felt it was not clear whether the question referred to their unborn child or a child which they already had. This was clarified. Three women also suggested shortening the information and

debrief sheet, however, this was not possible due to the requirements of the Ethics Committee.

Two women expressed concerns about the measures used, saying that they felt they were not relevant to them. When asked specifically whether it had made them feel anxious being asked about difficulties in mood and PLEs, they said that they did not experience any prolonged distress, but it made them "wonder". Therefore, additional care was taken to use normalising language in the information and debrief sheets and contact information for organisations that can offer support was provided in a downloadable format both at the beginning and the end of the survey. Notably, these concerns were only expressed by women in their first pregnancy, which could be a reflection of higher levels of anxiety related to birth and motherhood reported in primiparous women compared to multiparous or postpartum women (Biaggi et al., 2016). As the questionnaires had been validated previously, the decision was made not to alter the wording.

It had also been planned to collect feedback from women with lived experience of PP on the wording of the information and debrief sheets, however, this was not actioned as the study underwent considerable changes due to the Covid-19 pandemic and an at-risk group was no longer included.

While both pregnant women and mothers piloted the study, it might have been beneficial to involve key stakeholders at later stages of the research process. The British Psychological Society (2010) recommend that service users be consulted in the formulation of research questions, analysis of data and dissemination of findings. While participants of this study cannot be defined as 'service users', feedback from participants showed that the meaning of individual survey questions and aims of the project were not always grasped. Therefore, further involvement of the target population in designing similar studies is recommended for future research.

Additionally, individuals with a diagnosis for non-affective psychosis experiencing VH could have been consulted about the proposed areas of interest (e.g. temporal aspects, content etc.) within the systematic review, to ensure that the language used was acceptable and categories accurately reflected the range of their experiences. While this is important to consider, requests for feedback were not made due to the fact that Covid-19 made working collaboratively with relevant services significantly more difficult as they had to make considerable and rapid changes to the way they functioned and had little capacity for additional requests to support research projects.

Participant Feedback

Women on social media appeared very interested in the research and many mentioned a personal interest in perinatal mental health when commenting on group posts. They noted their own experiences of perinatal mental health difficulties and spoke about their experiences of professional support which were both positive and negative. Some references were made to the unfortunate lack of research in the area. Participants were also proactive in sharing the survey link with other groups on social media and amongst friends who met inclusion criteria.

One participant got in touch by email saying that she had felt that the questions were not relevant to her experience and she responded “randomly”. This feedback highlights the importance of using measures relevant to the target population, which is difficult when investigating a phenomenon thought to occur on a continuum and therefore likely to feel more relevant for some than others. It also raises the question whether other participants did the same, reducing the validity of the study.

Impact

The results of the systematic review and empirical study have potential implications for a range of stakeholders, including clinicians, researchers, perinatal women and people

experiencing psychosis as well as their support networks. This section will discuss the impact of these findings on the mentioned stakeholders in turn, considering how the research contributes to existing knowledge in the area. Overall, contradictory findings – between the two pieces of research and compared to previous research – highlight not only the need for further research on psychological processes underpinning positive psychotic symptoms but also the importance of thinking about them without bias. For instance, presupposing that PLEs invariably lead to distress or making assumptions about the nature of VH should be considered as ill-advised and premature given the lack of consensus in these areas.

People Experiencing VH in the Context of Non-Affective Psychosis

This review was conducted on the basis that people experiencing VH in the context of non-affective psychosis may benefit from learning that VH, while unique in their details, have common features shared by many individuals, and that they can be understood and interpreted in multiple ways. Simply thinking about questions of their own personal VH phenomenology may allow them to become more accustomed with their experience in a way that goes beyond specific emotions at the time of the VH. Being aware of the details in their own experience may also help them to notice positive changes over time or detect specific early warning signs which could be part of a relapse prevention plan that does not only focus on symptom occurrence, but on factors important to the individual.

Additionally, their support networks could learn to ask detailed questions about VH and other psychotic symptoms, de-mystifying and de-stigmatising them by showing curiosity and an ability to listen. It may further be reassuring to hear that VH appear to be changeable and their presence does not necessarily impact on well-being and distress to the point of needing constant medical care. Being able to accept their presence in their loved one's life is likely to have positive knock-on effects on people with psychosis adopting normalising appraisals of VH. Family members could also be helpful in a more active way by questioning

negative appraisals rather than the reality of VH by communicating that they know that the VH is present, but not feeling threatened by it.

Women in the Perinatal Period

It is hoped that participation in the empirical study, as well as the dissemination of lay summaries of the findings via social media, specialist charities and clinical services, will help to destigmatise and normalise PLEs and distress of any kind in the perinatal period. Women may be reassured to know that PLEs *per se* do not indicate a need for care.

As it was found that (hypo)mania was related to extreme appraisals of internal mood states, women and their families may benefit from knowing that some mood fluctuations, in particular at a time of great change, are to be expected.

Clinicians

It is hoped that the findings of this research thesis can support effective clinical practice, supervision and training for clinicians supporting individuals experiencing VH and women in the perinatal period.

Firstly, the systematic review will provide basic knowledge of what VH may look like for an individual and most importantly encourage confidence and curiosity when asking patients about VH. The review stressed that clinicians' detailed understanding of VH, as of other psychotic symptoms, is of utmost importance, which is also true for the perinatal population. This review may have given a template to what assessment questions to ask when trying to understand an individual's experience such as "When do you see them?", "What do they look like?" "Do they talk or do anything else?" "What do you think about them?" and "How do you feel when you see them?". Given the range of phenomenological features highlighted in the review, it is hoped that clinicians show curiosity about a patient's individual experience, acknowledging that it is very common to have these experiences but that they may be slightly different for anyone.

Secondly, research on PLEs in the perinatal period is in its infancy and given the empirical study's null findings on the relationship between PLEs, appraisals and distress, findings have limited direct clinical impact. Nevertheless, comparably high scores on both PLEs and distress, even though unrelated, found in the study confirmed that the perinatal period can be a time of great upheaval, hence, transdiagnostic CBT or third wave approaches may be well placed to target both contextual factors and psychological processes known to underpin perinatal anxiety and depression (Bonacquisti et al., 2017).

Thirdly, it was found that extreme positive appraisals of internal states were associated with hypomanic symptoms in the perinatal period, suggesting that treatment approaches used for BD in the general populations may also be of use in the perinatal period. Further, the finding has potential implications for clinicians, as given the key role of appraisals of internal states, clinicians should be cautious about the potential of inadvertently confirming or driving such appraisals, through the advice they give (Kelly et al., 2017). This can put clinicians working with women in the perinatal period in a difficult position, as recognising signs of hypomania early on can be crucial in supporting and treating women. However, they may also be a common response to pregnancy and/or childbirth and advising a pregnant woman with a history of BD to be attentive to early signs of hypomania might fuel a belief that fluctuations in mood are markers of an imminent relapse.

Researchers

This research represents a valuable addition to existing literature and one which has the potential to impact on the direction of future research.

Firstly**,** there is a need for further research assessing the phenomenology of VH and investigating links between phenomenological aspects, underlying psychological mechanisms and impacts on individuals. Research based on the review's findings could be accommodated within network approaches, thinking about VH as symptoms within a

network connected to other symptoms, such as anxiety, hallucinations in other modalities or delusional beliefs. It could be hypothesised that the association between VH and distress is linked, with VH phenomenology and appraisal of VH impacting on emotional and behavioural responses to VH over time, where some aspects may act as feedback loops.

Secondly, the systematic review has highlighted important gaps in the literature which warrant further investigations such as qualitative research on VH, the occurrence and experience of fused hallucinations, and links between VH and other psychotic symptoms. It may be useful to draw on existing models and empirical evidence in the literature on AH to develop clearly defined research questions and hypotheses to further understanding of and treatment for VH which has been a neglected research area for too long. Indirectly, this highlights the importance of clearly understanding the phenomenology of individual symptoms known to be common in particular diagnoses, which is something that has not yet been achieved for PP.

Thirdly, researchers specifically investigating perinatal mental health could be beneficiaries of the current study, as they could undertake research as outlined previously.

Dissemination

To maximise the impact of this research, careful consideration has been given to the dissemination of findings. The empirical paper and systematic review will be submitted for publication in peer-reviewed academic journals. Clinical Psychology & Psychotherapy or Behavioural and Cognitive Psychotherapy have been identified as good choices for the empirical paper, due to their publication record on research on PLEs and reputation for publishing high quality research aimed at advancing the understanding of psychosis. For the systematic review, Schizophrenia Research, Schizophrenia Bulletin and The British Journal of Clinical Psychology will be considered. These journals have impact factors of 4.56, 7.58 and 2.54 respectively, according to Journal Citation Reports (Clarivate Analytics, 2020).

Consideration will be given to key words and search terms when preparing the manuscripts to make them easily accessible to interested readers. Additionally, manuscripts prepared for publication will be shared on ResearchGate making them widely available.

Further, applications will be made to present research at academic conferences such as the British Psychological Society's (BPS) and the British Association for Behavioural and Cognitive Psychotherapies' (BABCP) annual conferences. Hopefully, dissemination among the academic and clinical community will encourage others to undertake further research building on present findings.

A lay summary of the findings from the empirical study will be disseminated via email to all participants who requested them and will be posted on social media sites and online groups where the study was advertised. Additionally, a lay summary will be sent to the service which originally planned to contribute to the study to share with women accessing support and charities such as Action on Postpartum Psychosis and Maternal Mental Health Alliance. Further, findings will be shared with clinicians in a CAMHS team with perinatal specialism, where the author of the study is currently completing a clinical placement.

The findings of the empirical study were presented to staff and Trainee Clinical Psychologists at Royal Holloway, University of London in April 2021, via the video link platform Zoom. Attendance should have improved trainees' understanding of PLEs, PP and perinatal mental health, positively affecting their clinical work and may have encouraged future studies building upon this thesis. The entire thesis will be uploaded onto PURE, Royal Holloway's online institutional repository, for staff and student access.

References

Action on Postpartum Psychosis (2020, April 6). *What is Postpartum Psychosis?* https://www.app-network.org/

Aleman, A., & Larøi, F. (2008). *Hallucinations: The science of idiosyncratic perception* (pp. vii, 317). American Psychological Association. https://doi.org/10.1037/11751-000

Aleman, A., Nieuwenstein, M. R., Böcker, K. B. E., & De Haan, E. H. F. (1999). Temporal Stability of the Launay-Slade Hallucination Scale for High- and Low-Scoring Normal Subjects. *Psychological Reports*, *85*(3_suppl), 1101–1104. https://doi.org/10.2466/pr0.1999.85.3f.1101

Andreasen, N. C., Flaum, M., & Arndt, S. (1992). The Comprehensive Assessment of Symptoms and History (CASH): An Instrument for Assessing Diagnosis and Psychopathology. *Archives of General Psychiatry*, *49*(8), 615–623. https://doi.org/10.1001/archpsyc.1992.01820080023004

Appleby, L., Mortensen, P. B., & Faragher, E. B. (1998). Suicide and other causes of mortality after post-partum psychiatric admission. *The British Journal of Psychiatry*, *173*(3), 209–211. https://doi.org/10.1192/bjp.173.3.209

Aynsworth, C., Collerton, D., & Dudley, R. (2017a). Measures of visual hallucinations: Review and recommendations. *Clinical Psychology Review*, *57*, 164–182. https://doi.org/10.1016/j.cpr.2017.05.001

Aynsworth, C., Collerton, D., & Dudley, R. (2017b). Measures of visual hallucinations: Review and recommendations. *Clinical Psychology Review*, *57*, 164–182. https://doi.org/10.1016/j.cpr.2017.05.001

Baumeister, D., Sedgwick, O., Howes, O., & Peters, E. (2017). Auditory verbal hallucinations and continuum models of psychosis: A systematic review of the healthy voice-hearer

literature. *Clinical Psychology Review*, *51*, 125–141. https://doi.org/10.1016/j.cpr.2016.10.010

Beck, A. T., & Rector, N. A. (2003). A Cognitive Model of Hallucinations. *Cognitive Therapy and Research*, *27*(1), 19–52. https://doi.org/10.1023/A:1022534613005

Bell, V., Halligan, P. W., & Ellis, H. D. (2006). Explaining delusions: A cognitive perspective. *Trends in Cognitive Sciences*, *10*(5), 219–226. https://doi.org/10.1016/j.tics.2006.03.004

Bender, R., & Lange, S. (2001). Adjusting for multiple testing—When and how? *Journal of Clinical Epidemiology*, *54*(4), 343–349. https://doi.org/10.1016/s0895-4356(00)00314-0

Bergink, V., Burgerhout, K. M., Weigelt, K., Pop, V. J., de Wit, H., Drexhage, R. C., Kushner, S. A., & Drexhage, H. A. (2013). Immune system dysregulation in first-onset postpartum psychosis. *Biological Psychiatry*, *73*(10), 1000–1007. https://doi.org/10.1016/j.biopsych.2012.11.006

Bergink, V., Kushner, S. A., Pop, V., Kuijpens, H., Berg, M. P. L. den, Drexhage, R. C., Wiersinga, W., Nolen, W. A., & Drexhage, H. A. (2011). Prevalence of autoimmune thyroid dysfunction in postpartum psychosis. *The British Journal of Psychiatry*, *198*(4), 264–268. https://doi.org/10.1192/bjp.bp.110.082990

Bernardin, F., Schwan, R., Lalanne, L., Ligier, F., Angioi-Duprez, K., Schwitzer, T., & Laprevote, V. (2017). The role of the retina in visual hallucinations: A review of the literature and implications for psychosis. *Neuropsychologia*, *99*, 128–138. https://doi.org/10.1016/j.neuropsychologia.2017.03.002

Biaggi, A., Conroy, S., Pawlby, S., & Pariante, C. M. (2016). Identifying the women at risk of antenatal anxiety and depression: A systematic review. *Journal of Affective Disorders*, *191*, 62–77. https://doi.org/10.1016/j.jad.2015.11.014

Blackmore, E. R., Jones, I., Doshi, M., Haque, S., Holder, R., Brockington, I., & Craddock, N. (2006). Obstetric variables associated with bipolar affective puerperal psychosis. *British Journal of Psychiatry*, *188*(01), 32–36. https://doi.org/10.1192/bjp.188.1.32

Bonacquisti, A., Cohen, M. J., & Schiller, C. E. (2017). Acceptance and commitment therapy for perinatal mood and anxiety disorders: Development of an inpatient group intervention. *Archives of Women's Mental Health*, *20*(5), 645–654. https://doi.org/10.1007/s00737-017-0735-8

Bracha, H. S., Cabrera, F. J., Karson, C. N., & Bigelow, L. B. (1985). Lateralization of visual hallucinations in chronic schizophrenia. *Biological Psychiatry*, *20*(10), 1132–1136. https://doi.org/10.1016/0006-3223(85)90013-7

Brébion, G., David, A. S., Jones, H. M., Ohlsen, R., & Pilowsky, L. S. (2007). Temporal context discrimination in patients with schizophrenia: Associations with auditory hallucinations and negative symptoms. *Neuropsychologia*, *45*(4), 817–823. https://doi.org/10.1016/j.neuropsychologia.2006.08.009

Brett, C., Heriot-Maitland, C., McGuire, P., & Peters, E. (2014). Predictors of distress associated with psychotic-like anomalous experiences in clinical and non-clinical populations. *The British Journal of Clinical Psychology*, *53*(2), 213–227. https://doi.org/10.1111/bjc.12036

British Psychological Society (2010). *Good Practice Guidelines to support the involvement of Service Users and Carers in Clinical Psychology Services.* https://consaludmental.org/publicaciones/Goodpracticeinvolvementserviceuserscarersclinicalpsychologyservices.pdf

Burgerhout, K. M., Kamperman, A. M., Roza, S. J., Lambregtse-Van den Berg, M. P., Koorengevel, K. M., Hoogendijk, W. J. G., Kushner, S. A., & Bergink, V. (2017). Functional Recovery After Postpartum Psychosis: A Prospective Longitudinal Study.

The Journal of Clinical Psychiatry, *78*(1), 122–128. https://doi.org/10.4088/JCP.15m10204

Chadwick, P., & Birchwood, M. (1994). The Omnipotence of Voices: A Cognitive Approach to Auditory Hallucinations. *The British Journal of Psychiatry*, *164*(2), 190–201. https://doi.org/10.1192/bjp.164.2.190

Chaudron, L. H., & Pies, R. W. (2003). The relationship between postpartum psychosis and bipolar disorder: A review. *The Journal of Clinical Psychiatry*, *64*(11), 1284–1292.

Chiu, L. P., Putkonen, A.-R., & Rimón, R. (1988). Control of auditory and visual hallucinations using two behavioural techniques: A case report. *Psychiatria Fennica*, *19*, 75–85.

Clarivate Analytics. (2020). *2020 Journal Citation Reports.* *https://clarivate.com/webofsciencegroup/article/the-2020-journal-citation-reports-helping-you-make-better-informed-decisions-with-confidence/*

Clark, M. L., Waters, F., Vatskalis, T. M., & Jablensky, A. (2017). On the interconnectedness and prognostic value of visual and auditory hallucinations in first-episode psychosis. *European Psychiatry*, *41*, 122–128. https://doi.org/10.1016/j.eurpsy.2016.10.011

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155–159. https://doi.org/10.1037//0033-2909.112.1.155

Collerton, D., & Dudley, R. (2004). A COGNITIVE BEHAVIOURAL FRAMEWORK FOR THE TREATMENT OF DISTRESSING VISUAL HALLUCINATIONS IN OLDER PEOPLE. *Behavioural and Cognitive Psychotherapy*, *32*(4), 443–455. https://doi.org/10.1017/S1352465804001626

Cooper, G. M., Lewis, G., & Neilson, J. (2002). Confidential enquiries into maternal deaths, 1997–1999. *British Journal of Anaesthesia*, *89*(3), 369–372. https://doi.org/10.1093/bja/89.3.369

Craig, T. K. J., Rus-Calafell, M., Ward, T., Fornells-Ambrojo, M., McCrone, P., Emsley, R., & Garety, P. (2015). The effects of an Audio Visual Assisted Therapy Aid for Refractory auditory hallucinations (AVATAR therapy): Study protocol for a randomised controlled trial. *Trials*, *16*, 349. https://doi.org/10.1186/s13063-015-0888-6

David, A. S. (2004). The cognitive neuropsychiatry of auditory verbal hallucinations: An overview. *Cognitive Neuropsychiatry*, *9*(1–2), 107–123. Scopus. https://doi.org/10.1080/13546800344000183

David, A. S. (2010). Why we need more debate on whether psychotic symptoms lie on a continuum with normality. *Psychological Medicine*, *40*(12), 1935–1942. https://doi.org/10.1017/S0033291710000188

Deahl, MartinP. (1987). DO PATIENTS SEE VISIONS THAT TALK? *The Lancet*, *329*(8536), 812. https://doi.org/10.1016/S0140-6736(87)92842-X

Delespaul, P., deVries, M., & van Os, J. (2002). Determinants of occurrence and recovery from hallucinations in daily life. *Social Psychiatry and Psychiatric Epidemiology*, *37*(3), 97–104. https://doi.org/10.1007/s001270200000

Dempsey, R. C., Gooding, P. A., & Jones, S. H. (2011). Positive and negative cognitive style correlates of the vulnerability to hypomania. *Journal of Clinical Psychology*, *67*(7), 673–690. https://doi.org/10.1002/jclp.20789

Dennis, C.-L., Falah-Hassani, K., & Shiri, R. (2017). Prevalence of antenatal and postnatal anxiety: Systematic review and meta-analysis. *The British Journal of Psychiatry: The Journal of Mental Science*, *210*(5), 315–323. https://doi.org/10.1192/bjp.bp.116.187179

Dennis, C.-L., & Hodnett, E. D. (2007). Psychosocial and psychological interventions for treating postpartum depression. *Cochrane Database of Systematic Reviews*, *4*. https://doi.org/10.1002/14651858.CD006116.pub2

DeRosse, P., & Karlsgodt, K. H. (2015). Examining the Psychosis Continuum. *Current Behavioral Neuroscience Reports*, *2*(2), 80–89. https://doi.org/10.1007/s40473-015-0040-7

Di Florio, A., Gordon-Smith, K., Forty, L., Kosorok, M. R., Fraser, C., Perry, A., Bethell, A., Craddock, N., Jones, L., & Jones, I. (2018). Stratification of the risk of bipolar disorder recurrences in pregnancy and postpartum. *The British Journal of Psychiatry*, *213*(3), 542–547. https://doi.org/10.1192/bjp.2018.92

Doucet, S., Jones, I., Letourneau, N., Dennis, C.-L., & Blackmore, E. R. (2011). Interventions for the prevention and treatment of postpartum psychosis: A systematic review. *Archives of Women's Mental Health*, *14*(2), 89–98. https://doi.org/10.1007/s00737-010-0199-6

Downes, M. J., Brennan, M. L., Williams, H. C., & Dean, R. S. (2016). Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). *BMJ Open*, *6*(12), e011458. https://doi.org/10.1136/bmjopen-2016-011458

Dudley, R., Aynsworth, C., Cheetham, R., McCarthy-Jones, S., & Collerton, D. (2018). Prevalence and characteristics of multi-modal hallucinations in people with psychosis who experience visual hallucinations. *Psychiatry Research*, *269*, 25–30. https://doi.org/10.1016/j.psychres.2018.08.032

Dudley, R., Wood, M., Spencer, H., Brabban, A., Mosimann, U. P., & Collerton, D. (2012). Identifying Specific Interpretations and Use of Safety Behaviours in People with Distressing Visual Hallucinations: An Exploratory Study. *Behavioural and Cognitive Psychotherapy*, *40*(3), 367–375. https://doi.org/10.1017/S1352465811000750

Escartí, M. J., de la Iglesia-Vayá, M., Martí-Bonmatí, L., Robles, M., Carbonell, J., Lull, J. J., García-Martí, G., Manjón, J. V., Aguilar, E. J., Aleman, A., & Sanjuán, J. (2010). Increased amygdala and parahippocampal gyrus activation in schizophrenic patients

with auditory hallucinations: An fMRI study using independent component analysis. *Schizophrenia Research*, *117*(1), 31–41. https://doi.org/10.1016/j.schres.2009.12.028

Fernyhough, C. (2019). Modality-general and modality-specific processes in hallucinations. *Psychological Medicine*, *49*(16), 2639–2645. https://doi.org/10.1017/S0033291719002496

Field, A. P. (2013). *Discovering statistics using IBM SPSS statistics: and sex and drugs and rock 'n' roll* (4th edition). Los Angeles: Sage.

Fisher, J., Cabral de Mello, M., Patel, V., Rahman, A., Tran, T., Holton, S., & Holmes, W. (2012). Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: A systematic review. *Bulletin of the World Health Organization*, *90*(2), 139-149H. https://doi.org/10.2471/BLT.11.091850

Fonseca-Pedrero, E., Lemos-Giráldez, S., Paino, M., Sierra-Baigrie, S., Villazón-García, Ú., García-Portilla González, M. P., & Muñiz, J. (2010). Dimensionality of hallucinatory predisposition: Confirmatory factor analysis of the Launay-Slade Hallucination Scale-revised in college students. *Anales de Psicología*, *26*(1), 41–48.

Forde, R., Peters, S., & Wittkowski, A. (2020). Recovery from postpartum psychosis: A systematic review and metasynthesis of women's and families' experiences. *Archives of Women's Mental Health*. https://doi.org/10.1007/s00737-020-01025-z

Frieske, D. A., & Wilson, W. P. (1966). Formal qualities of hallucinations: A comparative study of the visual hallucinations in patients with schizophrenic, organic, and affective psychoses. *Proceedings of the Annual Meeting of the American Psychopathological Association*, *54*, 49–62.

Garety, P., Kuipers, E., G. Fowler, D., Freeman, D., & Bebbington, P. (2001). A cognitive model of positive symptoms of psychosis. *Psychological Medicine*, *31*, 189–195. https://doi.org/10.1017/S0033291701003312

Gauntlett-Gilbert, J., & Kuipers, E. (2005). Visual hallucinations in psychiatric conditions: Appraisals and their relationship to distress. *The British Journal of Clinical Psychology*, *44*(Pt 1), 77–87. https://doi.org/10.1348/014466504x19451

Gavin, N. I., Gaynes, B. N., Lohr, K. N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal Depression: A Systematic Review of Prevalence and Incidence. *Obstetrics & Gynecology*, *106*(5 Part 1), 1071–1083. https://doi.org/10.1097/01.AOG.0000183597.31630.db

Gawęda, Ł., Prochwicz, K., & Cella, M. (2015). Cognitive biases mediate the relationship between temperament and character and psychotic-like experiences in healthy adults. *Psychiatry Research*, *225*(1), 50–57. https://doi.org/10.1016/j.psychres.2014.10.006

Gecici, O., Kuloglu, M., Guler, O., Ozbulut, O., Kurt, E., Onen, S., Ekinci, O., Yesilbas, D., Caykoylu, A., Emül, M., Alatas, G., & Albayrak, Y. (2010). Phenomenology of Delusions and Hallucinations in Patients with Schizophrenia. *Klinik Psikofarmakoloji Bülteni-Bulletin of Clinical Psychopharmacology*, *20*(3), 204–212. https://doi.org/10.1080/10177833.2010.11790661

Goldstone, E., Farhall, J., & Ong, B. (2012). Modelling the emergence of hallucinations: Early acquired vulnerabilities, proximal life stressors and maladaptive psychological processes. *Social Psychiatry and Psychiatric Epidemiology*, *47*(9), 1367–1380. https://doi.org/10.1007/s00127-011-0446-9

Goodwin, D. W., & Rosenthal, R. (1971). Clinical Significance of Hallucinations in Psychiatric Disorders: A Study of 116 Hallucinatory Patients. *Archives of General Psychiatry*, *24*(1), 76–80. https://doi.org/10.1001/archpsyc.1971.01750070078011

Grover, S. (2012). Lilliputian hallucinations in Schizophrenia: A case report. *African Journal of Psychiatry*, *15*(5), 311–313. https://doi.org/10.4314/ajpsy.v15i5.37

Haddock, G., McCARRON, J., Tarrier, N., & Faragher, E. B. (1999). Scales to measure dimensions of hallucinations and delusions: The psychotic symptom rating scales (PSYRATS). *Psychological Medicine*, *29*(4), 879–889. https://doi.org/10.1017/S0033291799008661

Harrison, J. K., Reid, J., Quinn, T. J., & Shenkin, S. D. (2017). Using quality assessment tools to critically appraise ageing research: A guide for clinicians. *Age and Ageing*, *46*(3), 359–365. https://doi.org/10.1093/ageing/afw223

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium. *Communication Monographs*, *76*(4), 408–420. https://doi.org/10.1080/03637750903310360

Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis: Second Edition: A Regression-Based Approach*. https://www.guilford.com/books/Introduction-to-Mediation-Moderation-and-Conditional-Process-Analysis/Andrew-Hayes/9781462534654

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, *44*(2), 227–239. https://doi.org/10.1348/014466505X29657

Heron, J., Haque, S., Oyebode, F., Craddock, N., & Jones, I. (2009). A longitudinal study of hypomania and depression symptoms in pregnancy and the postpartum period.

Bipolar Disorders, *11*(4), 410–417. https://doi.org/10.1111/j.1399-5618.2009.00685.x

Heron, J., McGuinness, M., Blackmore, E. R., Craddock, N., & Jones, I. (2008). Early postpartum symptoms in puerperal psychosis. *BJOG: An International Journal of Obstetrics and Gynaecology*, *115*(3), 348–353. https://doi.org/10.1111/j.1471-0528.2007.01563.x

Heron, J., & Oyebode, F. (2011). Postpartum hypomania: Future perspective. *Neuropsychiatry*, *1*(1), 55–60. https://doi.org/10.2217/npy.10.4

Hodgekins, J., Lower, R., Wilson, J., Cole, H., Ugochukwu, U., Maxwell, S., & Fowler, D. (2018). Clinician-rated and self-reported psychotic-like experiences in individuals accessing a specialist Youth Mental Health Service. *British Journal of Clinical Psychology*, *57*(3), 367–381. https://doi.org/10.1111/bjc.12178

Hoekstra, R., Johnson, A., & Kiers, H. A. L. (2012). Confidence Intervals Make a Difference: Effects of Showing Confidence Intervals on Inferential Reasoning. *Educational and Psychological Measurement*, *72*(6), 1039–1052. https://doi.org/10.1177/0013164412450297

Hoffman, C., Dunn, D. M., & Njoroge, W. F. M. (2017). Impact of Postpartum Mental Illness Upon Infant Development. *Current Psychiatry Reports*, *19*(12), 100. https://doi.org/10.1007/s11920-017-0857-8

Hoffman, R. E., & Varanko, M. (2006). 'Seeing voices': Fused visual/auditory verbal hallucinations reported by three persons with schizophrenia-spectrum disorder. *Acta Psychiatrica Scandinavica*, *114*(4), 290–292. https://doi.org/10.1111/j.1600-0447.2006.00791.x

Holt, L., Sellwood, W., & Slade, P. (2018). Birth experiences, trauma responses and self-concept in postpartum psychotic-like experiences. *Schizophrenia Research*, *197*, 531–538. https://doi.org/10.1016/j.schres.2017.12.015

Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M. P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M. C., Vedel, I., & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, *34*(4), 285–291.

Honig, A., Romme, M. A., Ensink, B. J., Escher, S. D., Pennings, M. H., & deVries, M. W. (1998). Auditory hallucinations: A comparison between patients and nonpatients. *The Journal of Nervous and Mental Disease*, *186*(10), 646–651. https://doi.org/10.1097/00005053-199810000-00009

Howard, L. M., Molyneaux, E., Dennis, C.-L., Rochat, T., Stein, A., & Milgrom, J. (2014). Non-psychotic mental disorders in the perinatal period. *Lancet (London, England)*, *384*(9956), 1775–1788. https://doi.org/10.1016/S0140-6736(14)61276-9

Howard, L. M., Ryan, E. G., Trevillion, K., Anderson, F., Bick, D., Bye, A., Byford, S., O'Connor, S., Sands, P., Demilew, J., Milgrom, J., & Pickles, A. (2018). Accuracy of the Whooley questions and the Edinburgh Postnatal Depression Scale in identifying depression and other mental disorders in early pregnancy. *The British Journal of Psychiatry: The Journal of Mental Science*, *212*(1), 50–56. https://doi.org/10.1192/bjp.2017.9

Inglis, A. J., Hippman, C. L., Carrion, P. B., Honer, W. G., & Austin, J. C. (2014). Mania and depression in the perinatal period among women with a history of major depressive disorders. *Archives of Women's Mental Health*, *17*(2), 137–143. https://doi.org/10.1007/s00737-013-0408-1

Jardri, R., Hugdahl, K., Hughes, M., Brunelin, J., Waters, F., Alderson-Day, B., Smailes, D., Sterzer, P., Corlett, P. R., Leptourgos, P., Debbané, M., Cachia, A., & Denève, S.

(2016). Are Hallucinations Due to an Imbalance Between Excitatory and Inhibitory Influences on the Brain? *Schizophrenia Bulletin*, *42*(5), 1124–1134. https://doi.org/10.1093/schbul/sbw075

Johns, L. C., & van Os, J. (2001). THE CONTINUITY OF PSYCHOTIC EXPERIENCES IN THE GENERAL POPULATION. *Clinical Psychology Review*, *21*(8), 1125–1141. https://doi.org/10.1016/S0272-7358(01)00103-9

Johnson, S. L., & Jones, S. (2009). Cognitive Correlates of Mania Risk: Are Responses to Success, Positive Moods, and Manic Symptoms Distinct or Overlapping? *Journal of Clinical Psychology*, *65*(9), 891–905. https://doi.org/10.1002/jclp.20585

Jones, I., & Craddock, N. (2001). Familiality of the Puerperal Trigger in Bipolar Disorder: Results of a Family Study. *American Journal of Psychiatry*, *158*(6), 913–917. https://doi.org/10.1176/appi.ajp.158.6.913

Jones, I., & Smith, S. (2009). Puerperal psychosis: Identifying and caring for women at risk. *Advances in Psychiatric Treatment*, *15*(6), 411–418. https://doi.org/10.1192/apt.bp.107.004333

Jones, S. H., Tai, S., Evershed, K., Knowles, R., & Bentall, R. (2006). Early detection of bipolar disorder: A pilot familial high-risk study of parents with bipolar disorder and their adolescent children. *Bipolar Disorders*, *8*(4), 362–372. https://doi.org/10.1111/j.1399-5618.2006.00329.x

Jones, S., Mansell, W., & Waller, L. (2006). Appraisal of hypomania-relevant experiences: Development of a questionnaire to assess positive self-dispositional appraisals in bipolar and behavioural high risk samples. *Journal of Affective Disorders*, *93*(1), 19–28. https://doi.org/10.1016/j.jad.2006.01.017

Kang, J. I., Kim, J.-J., Seok, J.-H., Chun, J. W., Lee, S.-K., & Park, H.-J. (2009). Abnormal brain response during the auditory emotional processing in schizophrenic patients with

chronic auditory hallucinations. *Schizophrenia Research*, *107*(1), 83–91. https://doi.org/10.1016/j.schres.2008.08.019

Karlsson, L. B. (2009). `Schizophrenic or Occult Harassed?': A Narrative Study of an Autobiographical Text about Auditory and Visual Hallucinations. *Qualitative Social Work*, *8*(1), 83–100. https://doi.org/10.1177/1473325008100421

Kay, S. R., Fiszbein, A., & Opler, L. A. (1987). The Positive and Negative Syndrome Scale (PANSS) for Schizophrenia. *Schizophrenia Bulletin*, *13*(2), 261–276. https://doi.org/10.1093/schbul/13.2.261

Kaymaz, N., Drukker, M., Lieb, R., Wittchen, H.-U., Werbeloff, N., Weiser, M., Lataster, T., & van Os, J. (2012). Do subthreshold psychotic experiences predict clinical outcomes in unselected non-help-seeking population-based samples? A systematic review and meta-analysis, enriched with new results. *Psychological Medicine*, *42*(11), 2239–2253. https://doi.org/10.1017/S0033291711002911

Kelleher, I., & Cannon, M. (2016). Putting Psychosis in Its Place. *The American Journal of Psychiatry*, *173*(10), 951–952. https://doi.org/10.1176/appi.ajp.2016.16070810

Kelly, R. E., Dodd, A. L., & Mansell, W. (2017). "When my Moods Drive Upward There Is Nothing I Can Do about It": A Review of Extreme Appraisals of Internal States and the Bipolar Spectrum. *Frontiers in Psychology*, *8*. https://doi.org/10.3389/fpsyg.2017.01235

Kelly, R. E., Mansell, W., Wood, A. M., Alatiq, Y., Dodd, A., & Searson, R. (2011). Extreme positive and negative appraisals of activated states interact to discriminate bipolar disorder from unipolar depression and non-clinical controls. *Journal of Affective Disorders*, *134*(1), 438–443. https://doi.org/10.1016/j.jad.2011.05.042

Kendell, R. E., Chalmers, J. C., & Platz, C. (1987). Epidemiology of Puerperal Psychoses. *The British Journal of Psychiatry*, *150*(5), 662–673. https://doi.org/10.1192/bjp.150.5.662

Krabbendam, L., Myin-Germeys, I., Graaf, R., Vollebergh, W., Nolen, W., Iedema, J., & van Os, J. (2004). Dimensions of depression, mania and psychosis in the general population. *Psychological Medicine*, *34*, 1177–1186. https://doi.org/10.1017/S0033291703001892

Kumar, R., Marks, M., Platz, C., & Yoshida, K. (1995). Clinical survey of a psychiatric mother and baby unit: Characteristics of 100 consecutive admissions. *Journal of Affective Disorders*, *33*(1), 11–22. https://doi.org/10.1016/0165-0327(94)00067-J

Larkin, A. R. (1979). The form and content of schizophrenic hallucinations. *The American Journal of Psychiatry*, *136*(7), 940–943. https://doi.org/10.1176/ajp.136.7.940

Larøi, F. (2006). The Phenomenological Diversity of Hallucinations: Some theoretical and clinical implications. *Psychologica Belgica*, *46*(1–2), 163–183. https://doi.org/10.5334/pb-46-1-2-163

Larøi, F., & Woodward, T. S. (2007). Hallucinations from a cognitive perspective. *Harvard Review of Psychiatry*, *15*(3), 109–117. https://doi.org/10.1080/10673220701401993

Launay, G., & Slade, P. (1981). The measurement of hallucinatory predisposition in male and female prisoners. *Personality and Individual Differences*, *2*(3), 221–234. https://doi.org/10.1016/0191-8869(81)90027-1

Lee, K.-W., Chan, K.-W., Chang, W.-C., Lee, E. H.-M., Hui, C. L.-M., & Chen, E. Y.-H. (2016). A systematic review on definitions and assessments of psychotic-like experiences. *Early Intervention in Psychiatry*, *10*(1), 3–16. https://doi.org/10.1111/eip.12228

Lewis, K. J. S., Di Florio, A., Forty, L., Gordon-Smith, K., Perry, A., Craddock, N., Jones, L., & Jones, I. (2018). Mania triggered by sleep loss and risk of postpartum psychosis in women with bipolar disorder. *Journal of Affective Disorders*, *225*, 624–629. https://doi.org/10.1016/j.jad.2017.08.054

Lien, Y.-J., Kao, Y.-C., Liu, Y.-P., Chang, H.-A., Tzeng, N.-S., Lu, C.-W., Lin, S.-J., & Loh, C.-H. (2015). Relationships of perceived public stigma of mental illness and psychosis-like experiences in a non-clinical population sample. *Social Psychiatry and Psychiatric Epidemiology*, *50*(2), 289–298. https://doi.org/10.1007/s00127-014-0929-6

Linscott, R. J., & van Os, J. (2013). An updated and conservative systematic review and meta-analysis of epidemiological evidence on psychotic experiences in children and adults: On the pathway from proneness to persistence to dimensional expression across mental disorders. *Psychological Medicine*, *43*(06), 1133–1149. https://doi.org/10.1017/S0033291712001626

Loch, A., Chianca, C., Alves, T., Freitas, E., Hortêncio, L., Andrade, J., Bilt, M., Fontoni, M. R., Serpa, M., Gattaz, W., & Rössler, W. (2017). Poverty, low education, and the expression of psychotic-like experiences in the general population of São Paulo, Brazil. *Psychiatry Research*, *253*, 182–188. https://doi.org/10.1016/j.psychres.2017.03.052

Lovatt, A., Mason, O., Brett, C., & Peters, E. (2010). Psychotic-Like Experiences, Appraisals, and Trauma. *The Journal of Nervous and Mental Disease*, *198*(11), 813. https://doi.org/10.1097/NMD.0b013e3181f97c3d

Lowe, G. R. (1973). The Phenomenology of Hallucinations as an Aid to Differential Diagnosis. *The British Journal of Psychiatry*, *123*(577), 621–633. https://doi.org/10.1192/bjp.123.6.621

Ma, L.-L., Wang, Y.-Y., Yang, Z.-H., Huang, D., Weng, H., & Zeng, X.-T. (2020). Methodological quality (risk of bias) assessment tools for primary and secondary medical studies: What are they and which is better? *Military Medical Research*, *7*(1), 7. https://doi.org/10.1186/s40779-020-00238-8

MacKinnon, A. L., Naguib, M., Barr, H. J., Levinsson, A., Robins, S., Feeley, N., Hayton, B., Zelkowitz, P., & Gold, I. (2017). Delusional ideation during the perinatal period in a community sample. *Schizophrenia Research*, *179*, 17–22. https://doi.org/10.1016/j.schres.2016.09.027

Mannion, A., & Slade, P. (2014). Psychotic-like experiences in pregnant and postpartum women without a history of psychosis. *Schizophrenia Research*, *160*(1–3), 118–123. https://doi.org/10.1016/j.schres.2014.10.003

Mansell, W., Morrison, A. P., Reid, G., Lowens, I., & Tai, S. (2007). The Interpretation of, and Responses to, Changes in Internal States: An Integrative Cognitive Model of Mood Swings and Bipolar Disorders. *Behavioural and Cognitive Psychotherapy*, *35*(5), 515–539. https://doi.org/10.1017/S1352465807003827

Marks, M. N., Wieck, A., Checkley, S. A., & Kumar, R. (1992). Contribution of psychological and social factors to psychotic and non-psychotic relapse after childbirth in women with previous histories of affective disorder. *Journal of Affective Disorders*, *24*(4), 253–263. https://doi.org/10.1016/0165-0327(92)90110-R

Mayer-Gross, W., Slater, E. & Rom, M. (1969) *Clinical Psychiatry*. London: Bailliere, Tindall & Cassell.

McCabe, M. S., Fowler, R. C., Cadoret, R. J., & Winokur, G. (1972). Symptom Differences in Schizophrenia with Good and Poor Prognosis. *American Journal of Psychiatry*, *128*(10), 1239–1243. https://doi.org/10.1176/ajp.128.10.1239

McGuffin, P., Farmer, A., & Harvey, I. (1991). A Polydiagnostic Application of Operational Criteria in Studies of Psychotic Illness: Development and Reliability of the OPCRIT System. *Archives of General Psychiatry*, *48*(8), 764–770. https://doi.org/10.1001/archpsyc.1991.01810320088015

McManus, S., Bebbington, P., Jenkins, R., & Brugha, T. (Eds.) (2016). M*ental health and wellbeing in England: Adult Psychiatric Morbidity Survey 2014.* Leeds: NHS Digital. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/556596/apms-2014-full-rpt.pdf

Melville, K. M., Casey, L. M., & Kavanagh, D. J. (2010). Dropout from Internet-based treatment for psychological disorders. *The British Journal of Clinical Psychology*, *49*(Pt 4), 455–471. https://doi.org/10.1348/014466509X472138

Mighton, C. E., Inglis, A. J., Carrion, P. B., Hippman, C. L., Morris, E. M., Andrighetti, H. J., Batallones, R., Honer, W. G., & Austin, J. C. (2016). Perinatal psychosis in mothers with a history of major depressive disorder. *Archives of Women's Mental Health*, *19*(2), 253–258. https://doi.org/10.1007/s00737-015-0561-9

Miller, L. J. (1996). Qualitative changes in hallucinations. *American Journal of Psychiatry*, *153*(2), 265–267. https://doi.org/10.1176/ajp.153.2.265

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, T. P. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Medicine*, *6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L. A., & PRISMA-P Group. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, *4*(1), 1. https://doi.org/10.1186/2046-4053-4-1

Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., Sfetcu, R., Currie, M., Qureshi, R., Mattis, P., Lisy, K., Mu, P.-F. (2017) Chapter 7: Systematic reviews of etiology and risk. In Aromataris, E., Munn, Z. (Eds), *Joanna Briggs Institute Reviewer's Manual. The Joanna Briggs Institute*. https://reviewersmanual.joannabriggs.org/

Moritz, S., Berna, F., Jaeger, S., Westermann, S., & Nagel, M. (2017). The customer is always right? Subjective target symptoms and treatment preferences in patients with psychosis. *European Archives of Psychiatry and Clinical Neuroscience*, *267*(4), 335–339. https://doi.org/10.1007/s00406-016-0694-5

Morrison, A. P., & Haddock, G. (1997). Cognitive factors in source monitoring and auditory hallucinations. *Psychological Medicine*, *27*(3), 669–679. https://doi.org/10.1017/s003329179700487x

Mosimann, U. P., Collerton, D., Dudley, R., Meyer, T. D., Graham, G., Dean, J. L., Bearn, D., Killen, A., Dickinson, L., Clarke, M. P., & McKeith, I. G. (2008). A semi-structured interview to assess visual hallucinations in older people. *International Journal of Geriatric Psychiatry*, *23*(7), 712–718. https://doi.org/10.1002/gps.1965

Mueser, K. T., Bellack, A. S., & Brady, E. U. (1990). Hallucinations in schizophrenia. *Acta Psychiatrica Scandinavica*, *82*(1), 26–29. https://doi.org/10.1111/j.1600-0447.1990.tb01350.x

Nager, A., Johansson, L.-M., & Sundquist, K. (2005). Are sociodemographic factors and year of delivery associated with hospital admission for postpartum psychosis? A study of 500 000 first-time mothers. *Acta Psychiatrica Scandinavica*, *112*(1), 47–53. https://doi.org/10.1111/j.1600-0447.2005.00525.x

Nager, A., Sundquist, K., Ramírez-León, V., & Johansson, L. M. (2008). Obstetric complications and postpartum psychosis: A follow-up study of 1.1 million first-time mothers between 1975 and 2003 in Sweden. *Acta Psychiatrica Scandinavica*, *117*(1), 12–19. https://doi.org/10.1111/j.1600-0447.2007.01096.x

National Collaborating Centre for Mental Health (2014). *Psychosis and Schizophrenia in Adults: Treatment and Management. NICE Clinical Guideline 178.*

http://www.nice.org.u/uidanc/g17/videnc/g178-psychosis-and-schizophrenia-in-adults-full-guideline3

National Collaborating Centre for Mental Health (2018). *The Perinatal Mental Health Care Pathways. Full implementation guidance.* London: National Collaborating Centre for Mental Health. https://www.rcpsych.ac.uk/docs/default-source/improving-care/nccmh/perinatal/nccmh-the-perinatal-mental-health-care-pathways-full-implementation-guidance.pdf?sfvrsn=73c19277_2

National Institute for Health and Care Excellence. (2014). *Antenatal and postnatal mental health: clinical management and service guidance. Clinical guideline [CG192]*. https://www.nice.org.uk/guidance/cg192

National Institute for Health and Care Excellence. (2016). *Antenatal and postnatal mental health. Quality standard* [QS115]. https://www.nice.org.uk/guidance/qs115

NHS England (2016) Implementing the Five Year Forward View for Mental Health. Available at: https://www.england.nhs.uk/mentalhealth/taskforce/imp/

Oertel, V., Rotarska-Jagiela, A., van de Ven, V. G., Haenschel, C., Maurer, K., & Linden, D. E. J. (2007). Visual hallucinations in schizophrenia investigated with functional magnetic resonance imaging. *Psychiatry Research: Neuroimaging*, *156*(3), 269–273. https://doi.org/10.1016/j.pscychresns.2007.09.004

Oh, H., Cogburn, C. D., Anglin, D., Lukens, E., & DeVylder, J. (2016). Major discriminatory events and risk for psychotic experiences among Black Americans. *American Journal of Orthopsychiatry*, *86*(3), 277–285. https://doi.org/10.1037/ort0000158

Oorschot, M., Lataster, T., Thewissen, V., Bentall, R., Delespaul, P., & Myin-Germeys, I. (2012). Temporal dynamics of visual and auditory hallucinations in psychosis. *Schizophrenia Research*, *140*(1), 77–82. https://doi.org/10.1016/j.schres.2012.06.010

Parkes, C. M. (1963) Interhospital and intrahospital variations in the diagnosis and severity of schizophrenia. *British Journal of Preventive & Social Medicine*, *17*(2), 85–89. http://dx.doi.org/10.1136/jech.17.2.85

Perry, A., Gordon-Smith, K., Di Florio, A., Forty, L., Craddock, N., Jones, L., & Jones, I. (2016). Adverse childhood life events and postpartum psychosis in bipolar disorder. *Journal of Affective Disorders*, *205*, 69–72. https://doi.org/10.1016/j.jad.2016.06.061

Perry, A., Gordon-Smith, K., Webb, I., Fone, E., Di Florio, A., Craddock, N., Jones, I., & Jones, L. (2019). Postpartum psychosis in bipolar disorder: No evidence of association with personality traits, cognitive style or affective temperaments. *BMC Psychiatry*, *19*(1), 395. https://doi.org/10.1186/s12888-019-2392-0

Peters, E. R., Moritz, S., Schwannauer, M., Wiseman, Z., Greenwood, K. E., Scott, J., Beck, A. T., Donaldson, C., Hagen, R., Ross, K., Veckenstedt, R., Ison, R., Williams, S., Kuipers, E., & Garety, P. A. (2014). Cognitive Biases Questionnaire for Psychosis. *Schizophrenia Bulletin*, *40*(2), 300–313. https://doi.org/10.1093/schbul/sbs199

Peters, E., Ward, T., Jackson, M., Woodruff, P., Morgan, C., McGuire, P., & Garety, P. A. (2017). Clinical relevance of appraisals of persistent psychotic experiences in people with and without a need for care: An experimental study. *The Lancet. Psychiatry*, *4*(12), 927–936. https://doi.org/10.1016/S2215-0366(17)30409-1

Phillipson, O. T., & Harris, J. P. (1985). Perceptual changes in schizophrenia: A questionnaire survey. *Psychological Medicine*, *15*(4), 859–866. https://doi.org/10.1017/S0033291700005092

Pienkos, E., Giersch, A., Hansen, M., Humpston, C., McCarthy-Jones, S., Mishara, A., Nelson, B., Park, S., Raballo, A., Sharma, R., Thomas, N., & Rosen, C. (2019). Hallucinations Beyond Voices: A Conceptual Review of the Phenomenology of Altered Perception in

Psychosis. *Schizophrenia Bulletin*, *45*(Supplement_1), S67–S77. https://doi.org/10.1093/schbul/sby057

Pike, C. K., & Hudson, W. W. (1998). Reliability and Measurement Error in the Presence of Homogeneity. *Journal of Social Service Research*, *24*(1–2), 149–163. https://doi.org/10.1300/J079v24n01_07

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891. https://doi.org/10.3758/brm.40.3.879

Preti, A., Bonventre, E., Ledda, V., Petretto, D. R., & Masala, C. (2007). Hallucinatory experiences, delusional thought proneness, and psychological distress in a nonclinical population. *Journal of Nervous and Mental Disease*, *195*(6), 484–491. https://doi.org/10.1097/NMD.0b013e31802f205e

Preti, A., Cella, M., Raballo, A., & Vellante, M. (2012). Psychotic-Like or Unusual Subjective Experiences? The role of certainty in the appraisal of the subclinical psychotic phenotype. *Psychiatry Research*, *200*(2), 669–673. https://doi.org/10.1016/j.psychres.2012.07.014

Prochwicz, K., & Kłosowska, J. (2018). The moderating role of cognitive biases on the relationship between negative affective states and psychotic-like experiences in non-clinical adults. *Psychiatry Research*, *265*, 118–127. https://doi.org/10.1016/j.psychres.2018.04.023

Protheroe, C. (1969). Puerperal psychosis: A long-term study 1927–1961. *British Journal of Psychiatry*, *111*(9), 9–30.

Reeve, S., Emsley, R., Sheaves, B., & Freeman, D. (2018). Disrupting Sleep: The Effects of Sleep Loss on Psychotic Experiences Tested in an Experimental Study With

Mediation Analysis. *Schizophrenia Bulletin*, *44*(3), 662–671. https://doi.org/10.1093/schbul/sbx103

Reininghaus, U., Kempton, M. J., Valmaggia, L., Craig, T. K. J., Garety, P., Onyejiaka, A., Gayer-Anderson, C., So, S. H., Hubbard, K., Beards, S., Dazzan, P., Pariante, C., Mondelli, V., Fisher, H. L., Mills, J. G., Viechtbauer, W., McGuire, P., van Os, J., Murray, R. M., … Morgan, C. (2016). Stress Sensitivity, Aberrant Salience, and Threat Anticipation in Early Psychosis: An Experience Sampling Study. *Schizophrenia Bulletin*, *42*(3), 712–722. https://doi.org/10.1093/schbul/sbv190

Robertson, E., Jones, I., Haque, S., Holder, R., & Craddock, N. (2005). Risk of puerperal and non-puerperal recurrence of illness following bipolar affective puerperal (post-partum) psychosis. *The British Journal of Psychiatry*, *186*(3), 258–259. https://doi.org/10.1192/bjp.186.3.258

Robertson, E., & Lyons, A. (2003). Living with puerperal psychosis: A qualitative analysis. *Psychology and Psychotherapy*, *76*(Pt 4), 411–431. https://doi.org/10.1348/147608303770584755

Rodier, M., Prévost, M., Renoult, L., Lionnet, C., Kwann, Y., Dionne-Dostie, E., Chapleau, I., & Debruille, J. B. (2011). Healthy people with delusional ideation change their mind with conviction. *Psychiatry Research*, *189*(3), 433–439. https://doi.org/10.1016/j.psychres.2011.06.018

Rubert, S. L., Hollender, M. H., & Mehrhof, E. G. (1961). Olfactory hallucinations. *Archives of General Psychiatry*, *5*, 313–318. https://doi.org/10.1001/archpsyc.1961.01710150095014

Rucci, P., Calugi, S., Miniati, M., & Fagiolini, A. (2013). A review of self-report and interview-based instruments to assess mania and hypomania symptoms. *Giornale Italiano Di Psicopatologia*, *19*, 143–159.

Saha, S., Scott, J. G., Varghese, D., & McGrath, J. J. (2011). The association between general psychological distress and delusional-like experiences: A large population-based study. *Schizophrenia Research*, *127*(1–3), 246–251. https://doi.org/10.1016/j.schres.2010.12.012

Sharma, V., Smith, A., & Khan, M. (2004). The relationship between duration of labour, time of delivery, and puerperal psychosis. *Journal of Affective Disorders*, *83*(2), 215–220. https://doi.org/10.1016/j.jad.2004.04.014

Shevlin, M., Dorahy, M., & Adamson, G. (2007). Childhood traumas and hallucinations: An analysis of the National Comorbidity Survey. *Journal of Psychiatric Research*, *41*(3), 222–228. https://doi.org/10.1016/j.jpsychires.2006.03.004

Sit, D., Rothschild, A. J., & Wisner, K. L. (2006). A Review of Postpartum Psychosis. *Journal of Women's Health*, *15*(4), 352–368. https://doi.org/10.1089/jwh.2006.15.352

Sitko, K., Bewick, B. M., Owens, D., & Masterson, C. (2020). Meta-analysis and Meta-regression of Cognitive Behavioral Therapy for Psychosis (CBTp) Across Time: The Effectiveness of CBTp has Improved for Delusions. *Schizophrenia Bulletin Open*, *1*(sgaa023). https://doi.org/10.1093/schizbullopen/sgaa023

Small, I. F., Small, J. G., & Andersen, J. M. (1966). Clinical characteristics of hallucinations of schizophrenia. *Diseases of the Nervous System*, *27*(5), 349–353.

Sommer, I. E. C., Daalman, K., Rietkerk, T., Diederen, K. M., Bakker, S., Wijkstra, J., & Boks, M. P. M. (2010). Healthy individuals with auditory verbal hallucinations; who are they? Psychiatric assessments of a selected sample of 103 subjects. *Schizophrenia Bulletin*, *36*(3), 633–641. https://doi.org/10.1093/schbul/sbn130

Spinelli, M. G. (2004). Maternal infanticide associated with mental illness: Prevention and the promise of saved lives. *The American Journal of Psychiatry*, *161*(9), 1548–1557. https://doi.org/10.1176/appi.ajp.161.9.1548

Steel, C. (2015). Hallucinations as a trauma-based memory: Implications for psychological interventions. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01262

Stephane, M., Thuras, P., Nasrallah, H., & Georgopoulos, A. P. (2003). The internal structure of the phenomenology of auditory verbal hallucinations. *Schizophrenia Research*, *61*(2), 185–193. https://doi.org/10.1016/S0920-9964(03)00013-6

Suwalska, J., Napierała, M., Bogdański, P., Łojko, D., Wszołek, K., Suchowiak, S., & Suwalska, A. (2021). Perinatal Mental Health during COVID-19 Pandemic: An Integrative Review and Implications for Clinical Practice. *Journal of Clinical Medicine*, *10*(11), 2406. https://doi.org/10.3390/jcm10112406

Tarrier, N., Kinney, C., Mccarthy, E., Wittkowski, A., Yusupoff, L., Gledhill, A., Morris, J., & Humphreys, L. (2001). Are some types of psychotic symptoms more responsive to cognitive-behaviour therapy? *Behavioural and Cognitive Psychotherapy*, *29*, 45–55. https://doi.org/10.1017/S1352465801001060

Tate, R. L., Perdices, M., Rosenkoetter, U., Shadish, W., Vohra, S., Barlow, D. H., Horner, R., Kazdin, A., Kratochwill, T., McDonald, S., Sampson, M., Shamseer, L., Togher, L., Albin, R., Backman, C., Douglas, J., Evans, J. J., Gast, D., Manolov, R., … Wilson, B. (2016). The Single-Case Reporting Guideline In BEhavioural Interventions (SCRIBE) 2016 Statement. *Physical Therapy*, *96*(7), e1–e10. https://doi.org/10.2522/ptj.2016.96.7.e1

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Teeple, R. C., Caplan, J. P., & Stern, T. A. (2009). Visual Hallucinations: Differential Diagnosis and Treatment. *Primary Care Companion to The Journal of Clinical Psychiatry*, *11*(1), 26–32.

Thomson, C., Wilson, R., Collerton, D., Freeston, M., & Dudley, R. (2017). Cognitive behavioural therapy for visual hallucinations: An investigation using a single-case experimental design. *The Cognitive Behaviour Therapist*, *10*. https://doi.org/10.1017/S1754470X17000174

Todres, L. (2007). Introduction: An Embodied Path at Beginning and End. In L. Todres (Ed.), *Embodied Enquiry: Phenomenological Touchstones for Research, Psychotherapy and Spirituality* (pp. 1–4). Palgrave Macmillan UK. https://doi.org/10.1057/9780230598850_1

Toh, W. L., McCarthy-Jones, S., Copolov, D., & Rossell, S. L. (2019). Have we overlooked the significance of multinodal hallucinations in schizophrenia? *Psychiatry Research*, *279*, 358–360. https://doi.org/10.1016/j.psychres.2019.06.018

Toh, W. L., Thomas, N., Robertson, M., & Rossell, S. L. (2020). Characteristics of non-clinical hallucinations: A mixed-methods analysis of auditory, visual, tactile and olfactory hallucinations in a primary voice-hearing cohort. *Psychiatry Research*, *289*, 112987. https://doi.org/10.1016/j.psychres.2020.112987

Underwood, R., Kumari, V., & Peters, E. (2016a). *Cognitive and Neural Models of Threat Appraisal in Psychosis: A theoretical integration* (Vol. 239). https://doi.org/10.1016/j.psychres.2016.03.016

Underwood, R., Kumari, V., & Peters, E. (2016b). Appraisals of psychotic experiences: An experimental investigation of symptomatic, remitted and non-need-for-care individuals. *Psychological Medicine*, *46*(6), 1249–1263. https://doi.org/10.1017/S0033291715002780

Upadhyaya, S. K., Sharma, A., & Raval, C. M. (2014). Postpartum Psychosis: Risk Factors Identification. *North American Journal of Medical Sciences*, *6*(6), 274–277. https://doi.org/10.4103/1947-2714.134373

Valdimarsdóttir, U., Hultman, C. M., Harlow, B., Cnattingius, S., & Sparén, P. (2009). Psychotic illness in first-time mothers with no previous psychiatric hospitalizations: A population-based study. *PLoS Medicine*, *6*(2), e13. https://doi.org/10.1371/journal.pmed.1000013

van Ommen, M. M., van Beilen, M., Cornelissen, F. W., Smid, H. G. O. M., Knegtering, H., Aleman, A., van Laar, T., & GROUP Investigators. (2016). The prevalence of visual hallucinations in non-affective psychosis, and the role of perception and attention. *Psychological Medicine*, *46*(8), 1735–1747. https://doi.org/10.1017/S0033291716000246

van Ommen, M. M., van Laar, T., Cornelissen, F. W., & Bruggeman, R. (2019). Visual hallucinations in psychosis. *Psychiatry Research*, *280*, 112517. https://doi.org/10.1016/j.psychres.2019.112517

VanderKruik, Rachel, Barreix, M., Chou, D., Allen, T., Say, L., & Cohen, L. S. (2017). The global prevalence of postpartum psychosis: A systematic review. *BMC Psychiatry*, *17*(1). https://doi.org/10.1186/s12888-017-1427-7

Ward, T. A., Gaynor, K. J., Hunter, M. D., Woodruff, P. W. R., Garety, P. A., & Peters, E. R. (2014). Appraisals and Responses to Experimental Symptom Analogues in Clinical and Nonclinical Individuals With Psychotic Experiences. *Schizophrenia Bulletin*, *40*(4), 845–855. https://doi.org/10.1093/schbul/sbt094

Waters, F. A. V., Badcock, J. C., Maybery, M. T., & Michie, P. T. (2003). Inhibition in schizophrenia: Association with auditory hallucinations. *Schizophrenia Research*, *62*(3), 275–280. https://doi.org/10.1016/s0920-9964(02)00358-4

Waters, F., Collerton, D., ffytche, D. H., Jardri, R., Pins, D., Dudley, R., Blom, J. D., Mosimann, U. P., Eperjesi, F., Ford, S., & Larøi, F. (2014). Visual Hallucinations in the Psychosis Spectrum and Comparative Information From Neurodegenerative Disorders and Eye

Disease. *Schizophrenia Bulletin*, *40*(Suppl 4), S233–S245. https://doi.org/10.1093/schbul/sbu036

Waters, F., & Fernyhough, C. (2017). Hallucinations: A Systematic Review of Points of Similarity and Difference Across Diagnostic Classes. *Schizophrenia Bulletin*, *43*(1), 32–43. https://doi.org/10.1093/schbul/sbw132

Wesseloo, R., Kamperman, A., Munk-Olsen, T., Pop, V., Kushner, S., & Bergink, V. (2015). P.2.d.007 Postpartum relapse risk in bipolar disorder and postpartum psychosis: A systematic review and meta-analysis. *European Neuropsychopharmacology*, *25*, S414. https://doi.org/10.1016/S0924-977X(15)30549-6

Wilson, R., Collerton, D., Freeston, M., Christodoulides, T., & Dudley, R. (2016). Is Seeing Believing? The Process of Change During Cognitive–behavioural Therapy for Distressing Visual Hallucinations. *Clinical Psychology & Psychotherapy*, *23*(4), 285–297. https://doi.org/10.1002/cpp.1962

Wisner, K. L., Peindl, K., & Hanusa, B. H. (1994). Symptomatology of affective and psychotic llnesses related to childbearing. *Journal of Affective Disorders*, *30*(2), 77–87. https://doi.org/10.1016/0165-0327(94)90034-5

Yung, A. R., Buckby, J. A., Cotton, S. M., Cosgrave, E. M., Killackey, E. J., Stanford, C., Godfrey, K., & McGorry, P. D. (2006). Psychotic-Like Experiences in Nonpsychotic Help-Seekers: Associations With Distress, Depression, and Disability. *Schizophrenia Bulletin*, *32*(2), 352–359. https://doi.org/10.1093/schbul/sbj018

Zarroug, E.-T. A. (1975). The Frequency of Visual Hallucinations in Schizophrenic Patients in Saudi Arabia. *British Journal of Psychiatry*, *127*(6), 553–555. https://doi.org/10.1192/bjp.127.6.553

Zlotnick, C., Johnson, S. L., Miller, I. W., Pearlstein, T., & Howard, M. (2001). Postpartum depression in women receiving public assistance: Pilot study of an interpersonal-

therapy-oriented group intervention. *The American Journal of Psychiatry*, *158*(4), 638–640. https://doi.org/10.1176/appi.ajp.158.4.638

Appendices

Appendix A

Quality appraisal of included studies

Quality Appraisal Tool for Case Reports

P. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Case Reports (last amended in 2017) **Website:** https://joannabriggs.org/critical_appraisal_tools https://wiki.joannabriggs.org/display/MANUAL/Appendix+7.4+Critical+appraisal+checklist+for+case+reports				
Major Components	Response options			
1. Were patient's demographic characteristics clearly described?	Yes	No	Unclear	Not applicable
2. Was the patient's history clearly described and presented as a timeline?	Yes	No	Unclear	Not applicable
3. Was the current clinical condition of the patient on presentation clearly described?	Yes	No	Unclear	Not applicable
4. Were diagnostic tests or assessment methods and the results clearly described?	Yes	No	Unclear	Not applicable
5. Was the intervention(s) or treatment procedure(s) clearly described?	Yes	No	Unclear	Not applicable
6. Was the post-intervention clinical condition clearly described?	Yes	No	Unclear	Not applicable
7. Were adverse events (harms) or unanticipated events identified and described?	Yes	No	Unclear	Not applicable
8. Does the case report provide takeaway lessons?	Yes	No	Unclear	Not applicable
Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐				

Table A1

Quality Appraisal of Case Reports

Study	Demographic characteristics	Patient's history	Clinical condition	Diagnostic tests / assessment	Intervention	Post intervention	Adverse events	Takeaway lessons	Score
Grover et al. (2012)	3	3	3	2	N/A	N/A	N/A	3	14 (of 15)
Hoffman & Varanko (2006)	2	1	3	1	N/A	N/A	N/A	3	11 (of 15)
Oertel et al. (2007)	3	2	3	3	N/A	N/A	N/A	3	14 (of 15)
Karlsson (2006)	3	2	3	3	N/A	N/A	N/A	3	14 (of 15)

Quality Appraisal Tool for Cross-Sectional Studies

L. The Appraisal tool for Cross-Sectional Studies (AXIS tool; last introduced on December 8, 2016)			
Major Components	Response options		
Introduction			
1. Were the aims/objectives of the study clear?	Yes	No	Do not know/ comment
Methods			
2. Was the study design appropriate for the stated aim(s)?	Yes	No	Do not know/ comment
3. Was the sample size justified?	Yes	No	Do not know/ comment

4. Was the target/reference population clearly defined? (Is it clear who the research was about?)	Yes	No	Do not know/ comment
5. Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?	Yes	No	Do not know/ comment
6. Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?	Yes	No	Do not know/ comment
7. Were measures undertaken to address and categorise non-responders?	Yes	No	Do not know/ comment
8. Were the risk factor and outcome variables measured appropriate to the aims of the study?	Yes	No	Do not know/ comment
9. Were the risk factor and outcome variables measured correctly using instruments/ measurements that had been trialled, piloted or published previously?	Yes	No	Do not know/ comment
10. Is it clear what was used to determined statistical significance and/or precision estimates? (eg, p values, CIs)	Yes	No	Do not know/ comment
11. Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	Yes	No	Do not know/ comment
Results			
12. Were the basic data adequately described?	Yes	No	Do not know/ comment
13. Does the response rate raise concerns about non-response bias?	Yes	No	Do not know/ comment
14. If appropriate, was information about non-responders described?	Yes	No	Do not know/ comment
15. Were the results internally consistent?	Yes	No	Do not know/ comment
16. Were the results for the analyses described in the methods, presented?	Yes	No	Do not know/ comment
Discussion			
17. Were the authors' discussions and conclusions justified by the results?	Yes	No	Do not know/ comment
18. Were the limitations of the study discussed?	Yes	No	Do not know/ comment
Other			
19. Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?	Yes	No	Do not know/ comment
20. Was ethical approval or consent of participants attained?	Yes	No	Do not know/ comment

Table A2

Quality Appraisal of Cross-sectional Studies: Introduction and Methods

Study	Aims	Design	Sample Size	Definition Target population	Represen-tative Sample	Selection Process	Non-responders	Outcome variables	Measurements	Statistical significance	Description of Methods
Bracha et al. (1985)	3	3	3	3	3	3	1	3	3	3	3
Delespaul et al. (2003)	3	3	1	3	3	1	3	2	3	3	3
Frieske & Wilson (1966)	3	3	1	3	3	3	1	3	2	3	3
Oorschot et al. (2012)	3	3	3	3	3	3	1	3	3	3	3
Small et al. (1966)	3	3	1	3	3	3	1	3	2	1	1
van Ommen et al. (2019)	3	3	2	3	3	3	1	3	2	3	3
Zarroug (1975)	3	3	3	3	3	3	1	3	2	N/A	3

Table A3

Quality Appraisal of Cross-sectional Studies: Results, Discussion and Other

Study	Description of Data	Non-response bias	Information non-responders	Internal consistency	Results based on analyses	Discussion and Conclusion	Limitations	Funding and Conflict of Interest	Ethical Approval / Consent	Score
Bracha et al. (1985)	3	3	1	3	3	3	3	3	3	56 (of 60)
Delespaul et al. (2003)	1	1	1	3	3	3	3	3	3	49 (of 60)
Frieske & Wilson (1966)	3	2	N/A	3	3	3	1	3	2	46 (of 57)
Oorschot et al. (2012)	3	3	1	3	3	3	3	3	3	56 (of 60)
Small et al. (1966)	1	2	1	3	3	3	1	3	2	49 (of 60)
van Ommen et al. (2019)	3	2	1	3	3	3	3	3	3	53 (of 60)
Zarroug (1975)	1	3	1	3	3	3	1	3	2	44 (of 57)

The Single-Case Reporting Guideline In BEhavioural Interventions (SCRIBE) 2016 Checklist

Item number	Topic	Item description	Score
TITLE and ABSTRACT			
1	Title	Identify the research as a single-case experimental design in the title	
2	Abstract	Summarize the research question, population, design, methods including intervention/s (independent variable/s) and target behavior/s and any other outcome/s (dependent variable/s), results, and conclusions	
INTRODUCTION			
3	Scientific background	Describe the scientific background to identify issue/s under analysis, current scientific knowledge, and gaps in that knowledge base	
4	Aims	State the purpose/aims of the study, research question/s, and, if applicable, hypotheses	
METHOD			
	DESIGN		
5	Design	Identify the design (e.g., withdrawal/reversal, multiple-baseline, alternating-treatments, changing-criterion, some combination thereof, or adaptive design) and describe the phases and phase sequence (whether determined a priori or data-driven) and, if applicable, criteria for phase change	
6	Procedural changes	Describe any procedural changes that occurred during the course of the investigation after the start of the study	
7	Replication	Describe any planned replication	
8	Randomization	State whether randomization was used, and if so, describe the randomization method and the elements of the study that were randomized	
9	Blinding	State whether blinding/masking was used, and if so, describe who was blinded/masked	
	PARTICIPANT/S or UNIT/S		
10	Selection criteria	State the inclusion and exclusion criteria, if applicable, and the method of recruitment	
11	Participant characteristics	For each participant, describe the demographic characteristics and clinical (or other) features relevant to the research question, such that anonymity is ensured	
	CONTEXT		
12	Setting	Describe characteristics of the setting and location where the study was conducted	
	APPROVALS		

13	Ethics	State whether ethics approval was obtained and indicate if and how informed consent and/or assent were obtained	
	MEASURES and MATERIALs		
14	Measures	Operationally define all target behaviors and outcome measures, describe reliability and validity, state how they were selected, and how and when they were measured	
15	Equipment	Clearly describe any equipment and/or materials (e.g., technological aids, biofeedback, computer programs, intervention manuals or other material resources) used to measure target behavior/s and other outcome/s or deliver the interventions	
	INTERVENTION		
16	Intervention	Describe the intervention and control condition in each phase, including how and when they were actually administered, with as much detail as possible to facilitate attempts at replication	
17	Procedural fidelity	Describe how procedural fidelity was evaluated in each phase	
	ANALYSIS		
18	Analyses	Describe and justify all methods used to analyze data	
19	Sequence completed	For each participant, report the sequence actually completed, including the number of trials for each session for each case. For participant/s who did not complete, state when they stopped and the reasons 20 Outcomes and	
RESULTS			
20	Outcomes and estimation	For each participant, report results, including raw data, for each target behavior and other outcome/s	
21	Adverse events	State whether or not any adverse events occurred for any participant and the phase in which they occurred	
DISCUSSION			
22	Interpretation	Summarize findings and interpret the results in the context of current evidence	
23	Limitations	Discuss limitations, addressing sources of potential bias and imprecision	
24	Applicability	Discuss applicability and implications of the study findings	
DOCUMENTATION			
25	Protocol	If available, state where a study protocol can be accessed	
26	Funding	Identify source/s of funding and other support; describe the role of funders	

Table A4

Quality Appraisal of Single-Case Reports

Study	Title	Abstract	Scientific Background	Aims	Design	Procedural changes	Replication	Randomization	Blinding
Chiu et al. (1988)	1	3	3	3	2	3	N/A	1	1
Thomson et al. (2017),	3	3	3	3	3	3	3	3	3
Wilson et al. (2016)	1	3	3	3	2	3	1	1	1

Study	Selection criteria	Participant characteristics	Setting	Ethics	Measures	Equipment	Intervention	Procedural fidelity	Analyses
Chiu et al. (1988)	1	3	3	1	2	3	2	1	3
Thomson et al. (2017),	3	3	3	3	3	3	3	3	3
Wilson et al. (2016)	1	3	3	1	2	3	2	1	3

Study	Sequence completed	Outcomes and estimation	Adverse events	Interpretation	Limitations	Applicability	Protocol	Funding	Score
Chiu et al. (1988)	3	3	3	3	1	3	N/A	2	54 (of 72)
Thomson et al. (2017),	3	3	3	3	3	3	N/A	3	75 (of 75)
Wilson et al. (2016)	3	3	3	3	1	3	N/A	2	55 (of 75)

Appendix B

Application for ethical approval

Research question summary:

The objective of this research is to investigate whether thinking styles, known as cognitive factors, which have been found to be relevant in psychosis and bipolar disorder, play key roles in the development of (hypo)mania and psychotic like experiences (PLEs) during pregnancy and the postpartum period. Further, it will be explored whether and how they are related to the experience of distress and a potential transition to Postpartum Psychosis (PP).

1. Do (hypo)mania and PLEs in pregnant women and in the postpartum period correlate?

2. Do extreme appraisals of internal states predict (hypo)mania?

3. Do biased appraisals of external events and extreme appraisals of internal states predict PLEs?

4. What is the nature of this relationship? Do biased appraisals of external events and extreme appraisals of internal states mediate the relationship between PLEs and distress?

Research method summary:

Design

The study will take the form of a survey, constructed on an online platform (e.g. Qualtrics) using a cross-sectional correlational design.

Sample / setting

Pregnant women from the general population (minimum sample size is 67) will be recruited from online platforms and social media.

Procedure

Participants will be required to read an online information sheet and provide informed consent to participate. They will also be asked if the consent to being contacted again after the birth of their baby for a follow-up study. They will then be asked for demographic and obstetric information, which include age, ethnicity, level of education, employment status and marital status as well as factors regarding pregnancy and child birth including pregnancy trimester, number of babies delivered, mode of delivery, subjective / traumatic experiences of birth and sleep. Then they will be asked to fill in a questionnaire. Total length of participation is not expected to exceed 30 minutes. All data will be collected online using Qualtrics.

Measures

Measures have been chosen due to high validity and reliability as well as their previous use in similar populations.

- Peters Delusions Inventory
- Launay–Slade Hallucination Scale-Revised
- Altman Mania Rating Scale
- Cognitive Biases Questionnaire for Psychosis
- Hypomania Interpretations Questionnaire
- Depression Anxiety Stress Scales–21

Ethics Review Details

You have chosen to submit your project to the REC for review.

Name: Mueller, Frederike (2017)

Email: NEJT011@live.rhul.ac.uk

Title of research project or grant: Unusual experiences of pregnant women and new mothers

Project type: Royal Holloway postgraduate research project/grant

Department: Psychology

Funding Body Category: No external funder

Funding Body:

Start date: 01/07/2020

End date: 30/06/2021

Confidentiality / Data storage

Any information collected during the course of the research will be handled in the strictest confidence, in accordance with the UK DataProtection Act 2018 for Health and Social Care Research, and the EU General Data Protection Regulation (GDPR). Participants' contact details will be removed from all information and the data will be stored in anonymised form on password-encrypted databases. Personal information will only be used to contact participants if they have agreed to be contacted (prize draw, summary of findings, follow-up study).

Risks to participants

Does your research involve any of the below?

Children (under the age of 16),

No

Participants with cognitive or physical impairment that may render them unable to give informed consent,

No

Participants who may be vulnerable for personal, emotional, psychological or other reasons,

Yes

Participants who may become vulnerable as a result of the conduct of the study (e.g. because it raises sensitive issues) or as a result of what is revealed in the study (e.g. criminal behaviour, or behaviour which is culturally or socially questionable),

No

Participants in unequal power relations (e.g. groups that you teach or work with, in which participants may feel coerced or unable to withdraw),

No

Participants who are likely to suffer negative consequences if identified (e.g. professional censure, exposure to stigma or abuse, damage to professional or social standing),

No

Participants will be pregnant or new mothers. The perinatal period can be a time of high stress for women and they are particularly vulnerable to mental health difficulties. Consequently, the study may identify participants with high levels of distress including high scores on measures of anxiety and depression. However, all participants will be invited to contact the researcher and project supervisor, experienced clinicians, and they will be provided with a a debrief and an information sheet signposting them to appropriate services and support.

Design and Data

Does your study include any of the following?

Will it be necessary for participants to take part in the study without their knowledge and/or informed consent at the time?,

No

Is there a risk that participants may be or become identifiable?,

No

Is pain or discomfort likely to result from the study?,

No

Could the study induce psychological stress or anxiety, or cause harm or negative consequences beyond the risks encountered in normal life?,

No

Does this research require approval from the NHS?,

No

If so what is the NHS Approval number,

Are drugs, placebos or other substances to be administered to the study participants, or will the study involve invasive, intrusive or potentially harmful procedures of any kind?,

No

Will human tissue including blood, saliva, urine, faeces, sperm or eggs be collected or used in the project?,

No

Will the research involve the use of administrative or secure data that requires permission from the appropriate authorities before use?,

No

Will financial inducements (other than reasonable expenses and compensation for time) be offered to participants?,

Yes

Is there a risk that any of the material, data, or outcomes to be used in this study has been derived from ethically-unsound procedures?,

No

Comment on NHS Ethics:

A previous version of this study including a clinical group of participants (women under the care of a perinatal mental health team) has been approved by NHS Ethics (Project ID 262575). Unfortunately, the study had to be adjusted to social distancing measures due to COVID-19, and will now only include a non-clinical group and online data collection. Please see letter of approval attached.

Due to the need of a high sample number and the nature of sampling (convenience), a prize draw will be used to support recruitment as it can be expected that pregnant women and new mothers have limited time resources to participate. Participants will therefore be entered into a prize draw for two £50 vouchers for a parent specific store. Participants will be informed that failure to fully complete a questionnaire will not disqualify them from entry to the prize draw. They will further be informed of the closing date of the study, the nature of the prize and how and when winners will be notified of results. By being explicit and clear, the impact of prize draws on informed consent and risks and benefits of participation will be minimised.

Risks to the Environment / Society

Will the conduct of the research pose risks to the environment, site, society, or artifacts?,

No

Will the research be undertaken on private or government property without permission?,

No

Will geological or sedimentological samples be removed without permission?,

No

Will cultural or archaeological artifacts be removed without permission?,

No

Risks to Researchers/Institution

Does your research present any of the following risks to researchers or to the institution?

Is there a possibility that the researcher could be placed in a vulnerable situation either emotionally or physically (e.g. by being alone with vulnerable, or potentially aggressive participants, by entering an unsafe environment, or by working in countries in which there is unrest)?,

No

Is the topic of the research sensitive or controversial such that the researcher could be ethically or legally compromised (e.g. as a result of disclosures made during the research)?,

No

Will the research involve the investigation or observation of illegal practices, or the participation in illegal practices?,

No

Could any aspects of the research mean that the University has failed in its duty to care for researchers, participants, or the environment / society?,

No

Is there any reputational risk concerning the source of your funding?,

No

Is there any other ethical issue that may arise during the conduct of this study that could bring the institution into disrepute?,

No

Declaration

By submitting this form, I declare that the questions above have been answered truthfully and to the best of my knowledge and belief, and that I take full responsibility for these responses. I undertake to observe ethical principles throughout the research project and to report any changes that affect the ethics of the project to the University Research Ethics Committee for review.

Certificate produced for user ID, NEJT011

Date: 03/08/2020 11:08

Signed by: Mueller, Frederike (2017)

Digital Signature: Frederike Mueller

Certificate dated: 03/08/2020

Files uploaded: Consent Form_version 1_07052020.docx

Debrief statement_version 1_07052020.docx

Participant information sheet_version 1_07052020.docx

Full-Review-2159-2020-06-05-14-50-NEJT011.pdf

Full-Review-2159-2020-06-16-09-20-NEJT011.pdf

Advert_27072020.pdf

AMRS (Altman et al., 1997).pdf

CBQp (Peters et al., 2014).pdf

DASS-21 (Lovibond & Lovibond, 1995).pdf

HIQ-10 (Jones et al. 2006).pdf

LSHS-R (Bentall & Slade, 1985).docx

PDI-21 (Peters et al., 2004).pdf

262575_19.LO.1287_(Approval)_Letter_of_HRA_Approval_28.04.2020.pdf

Full-Review-2159-2020-08-03-11-05-NEJT011.pdf

Appendix C

Ethical approval

Professor Katie Normington

Deputy Principal (Research)

Principal's Office

+44 (0) 1784 443928

k.normington @royalholloway.ac.uk

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23rd November 2020

Dear Frederike Mueller,

I can confirm that project ID number 2159 entitled 'Unusual experiences of pregnant women and new mothers' was approved by the Research Ethics Committee via the full ethical review process on the 16th September 2020.

Please report any subsequent changes that affect the ethics of the project to the University Research Ethics Committee ethics@rhul.ac.uk

Yours sincerely,

Professor Katie Normington

Deputy Principal (Research)

Principal's Office

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Appendix D

Participant information sheet

Unusual experiences of pregnant women and new mothers

PARTICIPANT INFORMATION SHEET

You have been invited to take part in a research study. Before you decide whether or not to take part it is important that you understand what is involved in the research and why the research is being conducted.

Please take time to read the following information carefully, and please do not hesitate to ask if anything is not clear or you need more details. Talk to others about the study if you wish and take time to decide whether or not you wish to take part.

What is the purpose of the study?

Pregnancy and the first months of being a new mother can be a rewarding but also very challenging experience. Up to 20% of women are affected by mental health difficulties at this important time in their lives. The purpose of the study is to find out more about how women feel during their pregnancy and the first year after giving birth, and factors influencing this. We are particularly interested in understanding how paranoid thinking and other unusual experiences may contribute to anxiety, depression and psychosis in women during pregnancy and the first year of motherhood.

Who is invited to take part?

Pregnant women (from 12 weeks of gestation) and new mothers (up to one year after giving birth) are asked to participate.

What will the study involve?

If you agree to take part, you will be asked to complete a web-based survey which will take around 40 min. You will be asked some questions about yourself (e.g. age, gender, marital status) and your pregnancy (e.g. weeks of gestation, number of pregnancy) and you will be asked to complete some questionnaires to learn about your experiences, interpretations of these experiences and mood.

If you are currently pregnant, we would like to know if there are any changes to your responses approximately four weeks after the birth of your baby. We will ask your consent to contact you again around that time to complete some of the same questionnaires.

Do I have to take part?

It is up to you to decide whether or not to take part in the study. If you like, you can contact the research team for further information before deciding whether or not to participate. To ensure anonymity, you will NOT have to provide your name or email address. However, you will be given the option to do so, in case you would like to receive a summary of the research findings and/or agree to be contacted again regarding a follow-up study approximately one month after your due date.

What if I want to withdraw my data from the study?

If you decide to take part, you are still free to withdraw at any time without any obligation to give a reason. If you do not want to continue, you can simply exit the survey.

If you wish to withdraw your responses from the study you will need to contact the research team via email. For this purpose you will be asked to provide a memorable word, which will be used to identify your data. This will mean that the data that you have given us will be deleted and not be used in the study.

Option to be entered into a prize draw

You can choose to be entered into a prize draw in order to receive one of two £50 vouchers for the shop Mamas and Papas. For this purpose we will ask you to provide your email address which will be stored separately from your responses and will only be used to inform you in case you have won a voucher. Should you decide to not fully complete the questionnaires, you will still be entered into the prize draw if you have chosen to do so. The study will close on 31st of January 2021 and you will be informed whether you will receive a £50 voucher on 26th of February 2021.

What are the possible disadvantages or risks of taking part?

There are no known disadvantages or risks associated with completing the questionnaires included in this study. It is not expected that you should feel discomfort or distress during or after taking part in this study, however, some people might feel surprised about their answers to the questionnaires or would like further information about wellbeing after completing the study, if this is the case, please inform the researcher and/or contact one of the support organisations using the contact details provided.

Will my taking part in the study be kept confidential?

Yes. Please be assured that any information collected during the course of the research will be handled in the strictest confidence, in accordance with the UK Data Protection Act 2018

for Health and Social Care Research, and the EU General Data Protection Regulation (GDPR). Royal Holloway, University of London is the sponsor for this study, based in the United Kingdom. Royal Holloway will be using information from you in order to undertake this study, and will act as the data controller for this study. This means that Royal Holloway is responsible for looking after your information and using it properly. Your contact details will be removed from all information and the data will be made anonymous. All of your data will be stored in anonymised form on password-encrypted databases.

We will only use your personal information (name and contact details) to contact you about the research study, to oversee the quality of the study, and to contact you if you have explicitly consented to being informed about the findings of the study, the outcome of the prize draw, or participation in future studies. The only people at Royal Holloway who will have access to information that identifies you will be people who need to contact you about your participation in the study. Individuals from Royal Holloway and regulatory organisations may look at our research records to check the accuracy of the research study.

When the study has finished, identifiable and anonymised data collected for the purpose of this research will be stored on Royal Holloway, University of London's secure data depository, Figshare and destroyed after 5 years.

You can find out more about how we use your information by contacting the researcher.

What will happen to the results of the study?

This study forms part of a doctoral thesis and is intended for submission for publication in a relevant peer-reviewed journal. No individual participants will be identifiable in any written report resulting from this study. If you provide your email address, a summary of the findings will be available to you after the study has ended.

Who is organising and funding the research?

The study is organised and funded by Royal Holloway, University of London, as part of the Doctorate in Clinical Psychology for Frederike Mueller.

Who has reviewed the project?

The study has been reviewed by Royal Holloway, University of London Psychology Department Ethics Committee and given approval on 16th September 2020 (ID 2159)

What if there is a problem?

If you have any concerns, you should initially contact the researchers, Frederike Mueller or Dr Olga Luzon, who will do their best to address your concerns (see contact details below). If you remain unhappy and wish to complain formally, you can contact the sponsor of this study, Royal Holloway University (Tel.: 01784 414 012).

From whom can I get more information?

Lead researcher: Frederike Mueller, Trainee Clinical Psychologist (Royal Holloway, University of London). Email: Frederike.Mueller.2017@live.rhul.ac.uk

Academic supervisor: Dr Olga Luzon, Clinical Psychologist (Royal Holloway, University of London). Email: Olga.luzon@rhul.ac.uk

Where can I get further support?

Some people can feel surprised at the responses they provide to questionnaires. If you felt uncomfortable or distressed and would like to access some support for this, or you would like some information on psychological wellbeing, please speak to your midwife or your GP.

You can also contact other organisations that offer support:

NCT's Pregnancy & Birth Line on 0300 330 0772, open Monday – Friday 9am – 10pm, or the **Postnatal Helpline** on 0300 330 0773, open Monday – Friday 9am – 1pm.

Improving Access to Psychological Therapies (IAPT) is a national NHS programme that provides support for depression and anxiety disorders. You can find your local IAPT service at www.iapt.nhs.uk

The Samaritans are available 24 hours a day to provide confidential emotional support for people who are experiencing feelings of distress, despair or suicidal thoughts. They can be reached in a number of ways. For the fastest response, it is best to telephone them. Tel: 116 123 (free to call); Email: jo@samaritans.org; Web: www.samaritans.org. Local Samaritans branches can be found on their website.

NHS Choices provides information from the NHS on a range of conditions, treatments, local services and healthy living. You can access this online at www.nhs.uk

IN AN EMERGENCY, for example, if you feel you are at risk of harming yourself or you are experiencing suicidal thoughts, please visit your local **Accident & Emergency department**.

Appendix E

Consent form

Unusual experiences of pregnant women and new mothers

CONSENT FORM

I confirm that I have read the information sheet for this study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. I can confirm I am 18 years or older. I agree to take part in the above study.

□ Yes □ No

NB. This will be presented at the beginning of the online survey. Participants will be required to click on a 'yes' box before proceeding to the next part of the web-based survey, alternatively there will be a clearly displayed Exit button and will be given the opportunity to exit the survey.

If consent is provided participants will be guided to:

Please enter a memorable word here:

The above information will be used to identify your data should you wish to withdraw from the study at a later date.

Appendix F

Debrief statement

Thank you for taking part in this study. The aim of the study is to find out more about pregnant women's and new mother's unusual experiences or paranoid thoughts, which are very common in the general population, and to understand whether these experiences are related to distress and particular ways of thinking.

Pregnancy and the first months of being a new mother can be a rewarding but also very challenging experience. Promoting wellbeing and good mental health at this important time in a woman's life has become a priority for the government and the NHS. Improving our understanding of what factors contribute to emotional difficulties and distress will allow us to provide the right support and treatments to those that need them. Our study focuses on exploring how paranoid thinking and other unusual experiences may contribute to anxiety, depression and psychosis in women during pregnancy and the first year of motherhood.

You were asked to fill in some information about yourself and your pregnancy as well as six questionnaires, which asked about any unusual experiences, how you perceive common daily events and changes in your mood as well as your body and whether you have felt anxious or low in mood. We are particularly interested to know how these different aspects relate to each other.

Some people can feel surprised at the responses they provide to questionnaires. If you felt uncomfortable or distressed and would like to access some support for this, or you would like some information on psychological wellbeing, please speak to your midwife or your GP.

You can also contact other organisations that offer support:

NCT's Pregnancy & Birth Line on 0300 330 0772, open Monday – Friday 9am – 10pm, or the **Postnatal Helpline** on 0300 330 0773, open Monday – Friday 9am – 1pm.

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NHS Choices provides information from the NHS on a range of conditions, treatments, local services and healthy living. You can access this online at www.nhs.uk

IN AN EMERGENCY, for example, if you feel you are at risk of harming yourself or you are experiencing suicidal thoughts, please visit your local **Accident & Emergency department**.

If you would like to discuss any aspect of this research, or would like to receive a summary of the findings, please contact us using the details below:

Lead researcher: Frederike Mueller, Trainee Clinical Psychologist (Royal Holloway, University of London). Email: Frederike.mueller.2017@live.rhul.ac.uk

Academic supervisor: Dr Olga Luzón, Clinical Psychologist (Royal Holloway, University of London). Email: Olga.luzon@rhul.ac.uk

Appendix G

Participant measures

Demographic and obstetric information

1. How old are you?

☐ 18-24 years old

☐ 25-34 years old

☐ 35-44 years old

☐ 45-54 years old

☐ 55-64 years old

☐ Prefer not to say

2. What is your ethnic background?

☐ Asian British

☐ Asian Indian

☐ Asian Pakistani

☐ Asian Bangladeshi

☐ Black British

☐ Black African

☐ Black Caribbean

☐ Mixed

☐ White British

☐ White Other – Please provide details:

☐ Other – Please provide details: ----------

☐ Prefer not to say

3. Do you have a religion?

☐ Buddhism

☐ Christianity

☐ Hinduism

☐ Islam

☐ Judaism

☐ No religion

☐ Sikhism

☐ Other

☐ Prefer not to say

4. What is the highest degree or level of school you have completed?

☐ No school leaving certificate

☐ GCSEs or equivalent

☐ A-Levels or equivalent

☐ Undergraduate degree

☐ Postgraduate degree

☐ Professional qualification (e.g. NVQ)

☐ Doctorate / PhD

☐ Prefer not to say

5. What is your employment status?

☐ Employed (part-time or full-time)

☐ Full-time parent / carer

☐ Student

☐ Self-employed

☐ Unable to work

☐ Unemployed

☐ Prefer not to say

6. What is you marital status?

☐ Single (never married)

☐ Married, or in a cohabiting partnership

☐ Widowed

☐ Divorced

☐ Separated

☐ Prefer not to say

7. Do you already have children?

☐ No, this is my first child.

☐ Yes, I already have one child.

☐ Yes, I already have two children.

☐ Yes, I already have three or more children

☐ Prefer not to say

8. Have you ever received a mental health diagnosis?

☐ No, I haven't.

☐ Yes, depression.

☐ Yes, anxiety.

☐ Yes, Other – Please provide details: ----------

9. Are you currently pregnant?

☐ Yes

☐ No, my child was born in the last year.

If a participant answers question 9) saying she is currently pregnant:

10. Which trimester of your pregnancy are you in?

☐ First trimester

☐ Second trimester

☐ Third trimester

☐ Prefer not to say

If a participant answers question 9) saying she had her baby in the last year: 11.

What was the mode of delivery of your recent birth?

☐ Caesarean section

☐ Vaginal delivery

☐ Prefer not to say

12. How did you experience your birth?

☐ Overall, it was a positive experience

☐ Overall, it was a negative experience.

☐ Overall, it was a neutral experience.

☐ Overall, it was a mixed experience (both positive and negative).

☐ Prefer not to say

If a participant answers question 12) saying she had a negative experience:

13. Would you say you had a traumatic experience during child birth?

☐ Yes

☐ No

☐ Prefer not to say

14. Have you experienced any mental health difficulties (as diagnosed by clinicians) after this birth?

☐ Yes, Postpartum Depression

☐ Yes, Postpartum Psychosis

☐ Yes, Other – Please provide details: ----------

☐ No.

☐ Prefer not to say

Launay–Slade Hallucination Scale-Revised (LSHS-R; Bentall and Slade, 1985)

Please score the below statements according to the extent to which you feel they apply to yourself.

1. No matter how hard I try to concentrate, unrelated thoughts always creep into my mind.
2. In my daydreams I can hear the sound of a tune almost as clearly as if I were actually listening to it,
3. Sometimes my thoughts seem as real as actual events in my life.
4. Sometimes a passing thought will seem so real that it frightens me
5. The sounds I hear in my daydreams are usually clear and distinct.
6. The people in my daydreams seem so true to life that I sometimes think they are
7. I often hear a voice speaking my thoughts aloud.
8. In the past 1 have had the experience of hearing a person's voice and then found that no one was there.
9. On occasions I have seen a person's face in front of me when no one was in fact.
10. I have heard the voice of the devil.
11. In the past I have heard the voice of God speaking to me.
12. I have been troubled by hearing voices in my head.

Response options:

- 'Certainly Applies' (4 points)
- 'Possibly Applies' (3 points)
- 'Unsure' (2 points)
- 'Possibly Does Not Apply' (1 point)
- 'Certainly Does Not Apply' (0 points)

Peters Delusions Inventory (PDI-21; Peters et al., 2004)

Appendix

P.D.I.-21

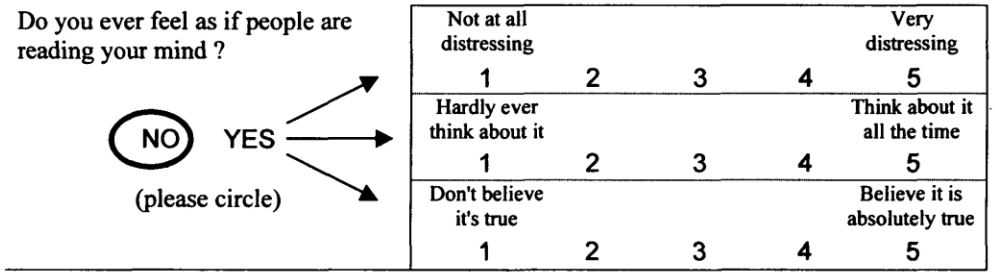
This questionnaire is designed to measure beliefs and vivid mental experiences. We believe that they are much more common than has previously been supposed, and that most people have had some such experiences during their lives. Please answer the following questions as honestly as you can. There are no right or wrong answers, and there are no trick questions.

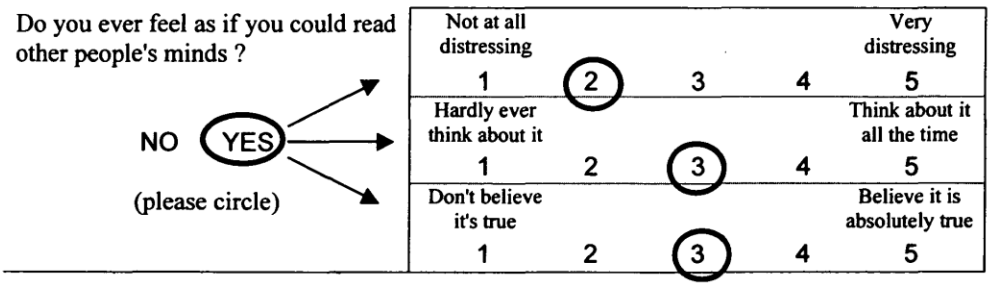
Please note that we are NOT interested in experiences people may have had when under the influence of drugs.

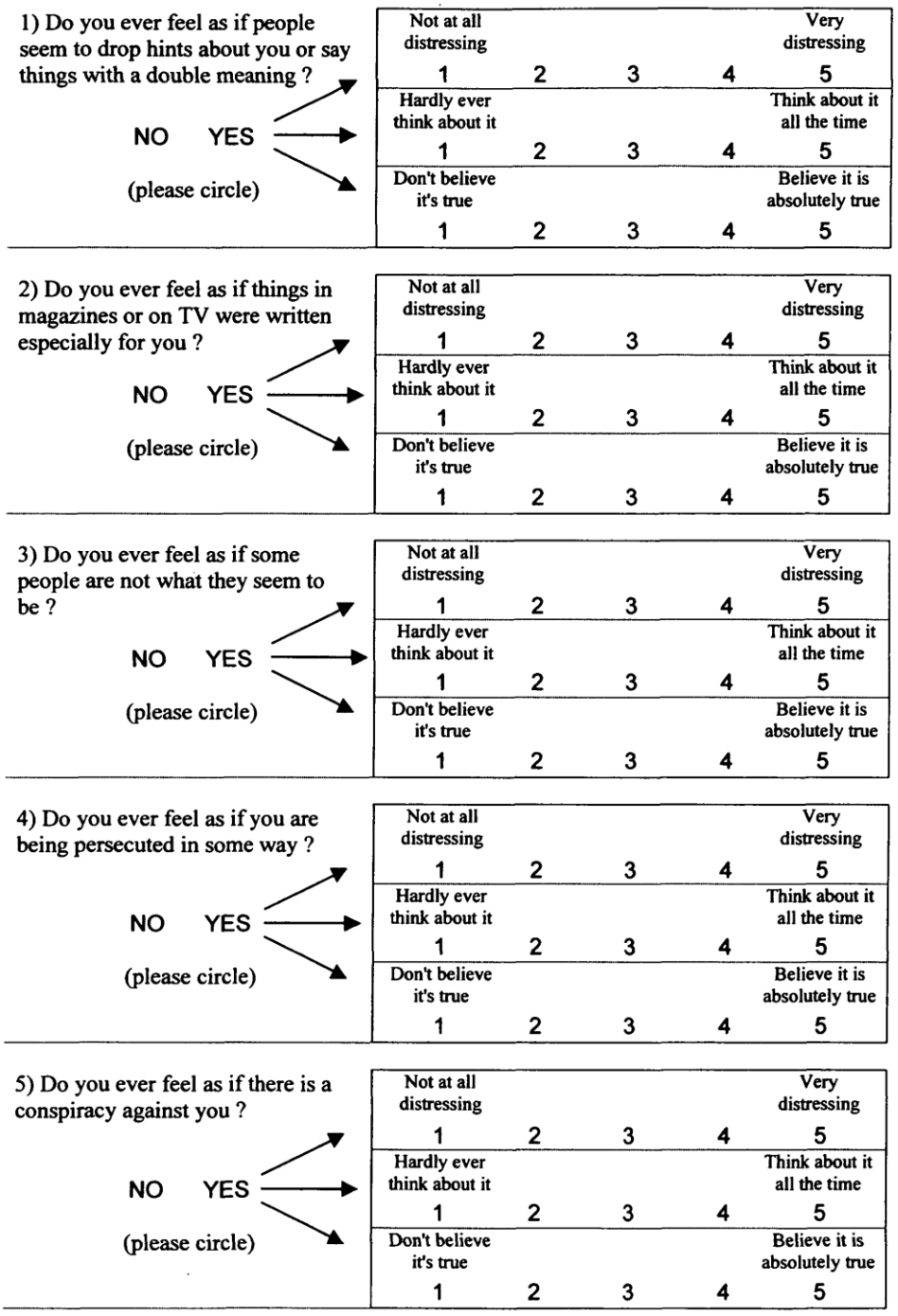
IT IS IMPORTANT THAT YOU ANSWER *ALL* QUESTIONS.

For the questions you answer YES to, we are interested in:
(a) how distressing these beliefs or experiences are
(b) how often you think about them; and
(c) how true you believe them to be.
On the right hand side of the page we would like you to circle the number which corresponds most closely to how distressing this belief is, how often you think about it, and how much you believe that it is true.
If you answer NO please move on to the next question.

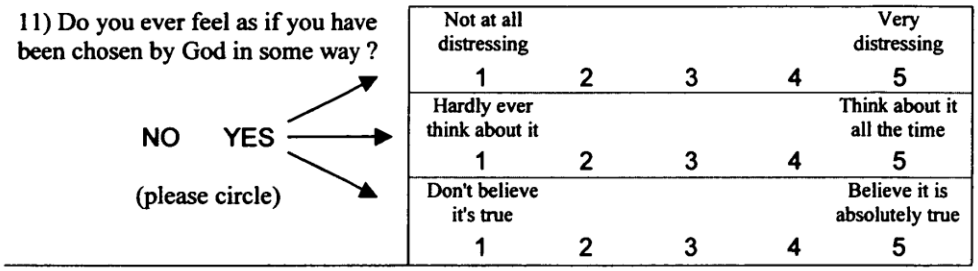
Example

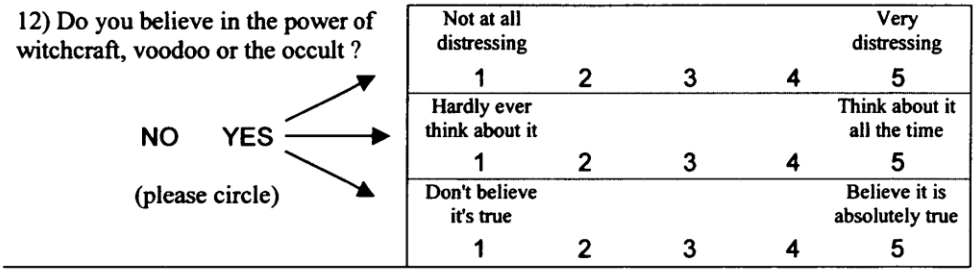


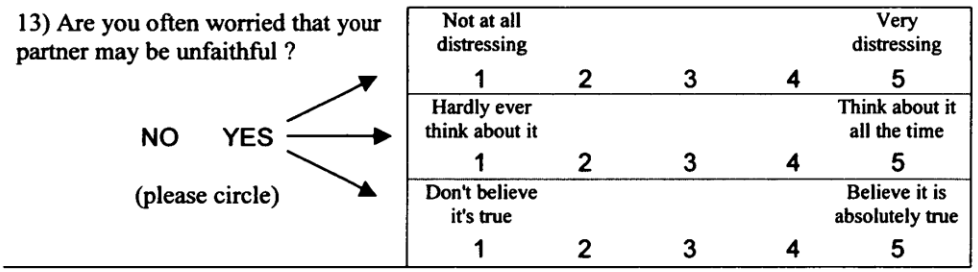


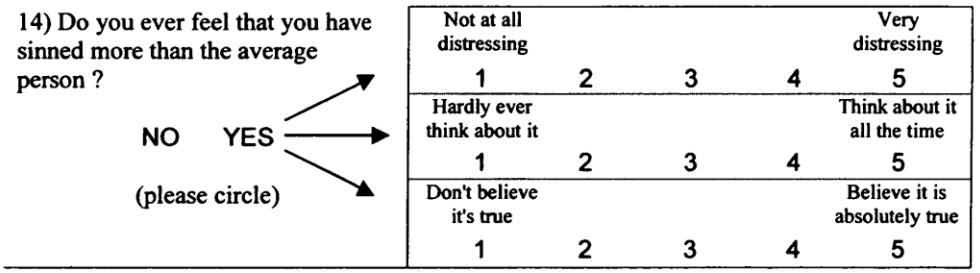

1) Do you ever feel as if people seem to drop hints about you or say things with a double meaning ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
2) Do you ever feel as if things in magazines or on TV were written especially for you ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
3) Do you ever feel as if some people are not what they seem to be ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
4) Do you ever feel as if you are being persecuted in some way ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
5) Do you ever feel as if there is a conspiracy against you ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5

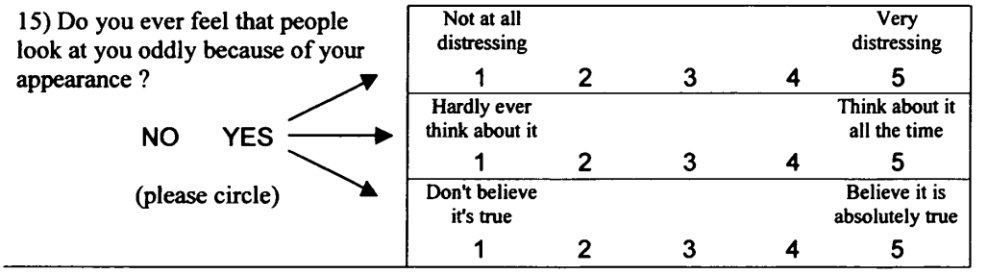
6) Do you ever feel as if you are, or destined to be someone very important ? NO YES (please circle)	Not at all distressing					Very distressing
	1	2	3	4	5	
	Hardly ever think about it					Think about it all the time
	1	2	3	4	5	
	Don't believe it's true					Believe it is absolutely true
	1	2	3	4	5	
7) Do you ever feel that you are a very special or unusual person ? NO YES (please circle)	Not at all distressing					Very distressing
	1	2	3	4	5	
	Hardly ever think about it					Think about it all the time
	1	2	3	4	5	
	Don't believe it's true					Believe it is absolutely true
	1	2	3	4	5	
8) Do you ever feel that you are especially close to God ? NO YES (please circle)	Not at all distressing					Very distressing
	1	2	3	4	5	
	Hardly ever think about it					Think about it all the time
	1	2	3	4	5	
	Don't believe it's true					Believe it is absolutely true
	1	2	3	4	5	
9) Do you ever think people can communicate telepathically ? NO YES (please circle)	Not at all distressing					Very distressing
	1	2	3	4	5	
	Hardly ever think about it					Think about it all the time
	1	2	3	4	5	
	Don't believe it's true					Believe it is absolutely true
	1	2	3	4	5	
10) Do you ever feel as if electrical devices such as computers can influence the way you think ? NO YES (please circle)	Not at all distressing					Very distressing
	1	2	3	4	5	
	Hardly ever think about it					Think about it all the time
	1	2	3	4	5	
	Don't believe it's true					Believe it is absolutely true
	1	2	3	4	5	


11) Do you ever feel as if you have been chosen by God in some way ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5


12) Do you believe in the power of witchcraft, voodoo or the occult ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5


13) Are you often worried that your partner may be unfaithful ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5


14) Do you ever feel that you have sinned more than the average person ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5


15) Do you ever feel that people look at you oddly because of your appearance ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5

16) Do you ever feel as if you had no thoughts in your head at all ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

17) Do you ever feel as if the world is about to end ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

18) Do your thoughts ever feel alien to you in some way ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

19) Have your thoughts ever been so vivid that you were worried other people would hear them ?

NO YES

(please circle)

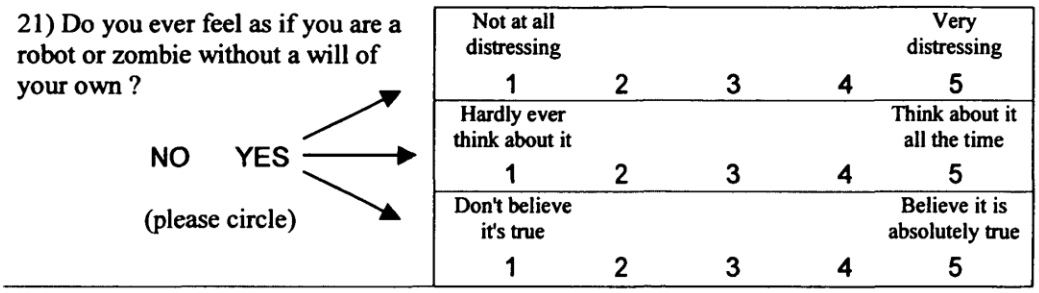
Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

20) Do you ever feel as if your own thoughts were being echoed back to you ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5



21-item Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

---

1 I found it hard to wind down

2 I was aware of dryness of my mouth

3 I couldn't seem to experience any positive feeling at all

4 I experienced breathing difficulty (eg excessively rapid breathing, breathlessness in the absence of physical exertion)

5 I found it difficult to work up the initiative to do things

6 I tended to over-react to situations

7 I experienced trembling (eg in the hands)

8 I felt that I was using a lot of nervous energy

9 I was worried about situations in which I might panic and make a fool of myself

10 I felt that I had nothing to look forward to

11 I found myself getting agitated

12 I found it difficult to relax

13 I felt down-hearted and blue

14 I was intolerant of anything that kept me from getting on with what I was doing

15 I felt I was close to panic

16 I was unable to become enthusiastic about anything

17 I felt I wasn't worth much as a person

18 I felt that I was rather touchy

19 I was aware of the action of my heart in the absence of physical exertion (eg sense of heart rate increase, heart missing a beat)

20 I felt scared without any good reason

21 I felt that life was meaningless

Cognitive Biases Questionnaire for Psychosis (CBQp, Peters et al., 2014).

Instructions

In this questionnaire you will find a number of descriptions of everyday events. After each situation are different ways that people might react, labeled A, B, or C. *Please imagine yourself in each situation as vividly as possible*. Once you have imagined that the event is happening to you, *please choose the option that best describes how you might think about the situation*. If none of the options matches completely how you might react, choose the one which is the closest. If more than 1 option applies, choose the one which would run through your mind most often. When you have decided which option you are most likely to think, put a circle around the letter next to it.
There are no right or wrong answers. Work through the questions fairly quickly, making sure you pick the option that is nearest to what your *immediate* reaction might be.

1. Imagine you receive a letter and you notice it is not sealed.
I am most likely to think: (please circle A, B, or C)
A: Someone has deliberately opened this letter already
B: I wonder if this may have been opened again after it was written
C: I don't think anything of it

2. Imagine that you are walking down the street when you hear your name being called, but when you look around you don't see anybody.
I am most likely to think: (please circle A, B, or C)
A: Something strange is going on
B: There is something really dangerous about this
C: I must be imagining things

3. Imagine your food tastes different from usual.
I am most likely to think: (please circle A, B, or C)
A: Someone may have done something to my food on purpose
B: This food must have been prepared with a different ingredient today
C: Someone has deliberately spiked my food

4. Imagine that on your way to work you notice that all the traffic lights turn red as you approach them.

I am most likely to think: (please circle A, B, or C)

A: It's going to take me longer to get in this morning

B: That's all I need, I'm going to be really late now

C: My day is going to be ruined

5. Imagine you are standing at a bus stop when the bus you have been waiting for drives past half empty without stopping.

I am most likely to think: (please circle A, B, or C)

A: People are always so nasty

B: People aren't very nice sometimes

C: The driver must be in a bad mood today

6. Imagine you have a really bad pain in your head.

I am most likely to think: (please circle A, B, or C)

A: There must be something wrong with me

B: There's lots of different reasons why I might have this pain

C: I must have something really serious, like a brain tumour

7. Imagine that while on the bus you notice a stranger staring at you.

I am most likely to think: (please circle A, B, or C)

A: The way this person is staring at me is a bit worrying

B: This person must mean me harm to be staring at me that way

C: This person is being really rude to be staring at me in that way

8. Imagine you are sitting at home and suddenly you feel very odd.

I am most likely to think: (please circle A, B, or C)

A: I wonder why I feel odd, could something sinister be going on somewhere

B: This feeling is proof that there is something bad happening somewhere to someone I know

C: I must be overtired or something

9. Imagine you applied for a job and did not get it.

I am most likely to think: (please circle A, B, or C)

A: Perhaps I can get some feedback about why I did not get the job

B: I wonder if I did not do very well at the interview

C: I'll never be able to get a job

10. Imagine that you are on a train when you suddenly have a strong feeling you have been there before.

I am most likely to think: (please circle A, B, or C)

A: This is some kind of premonition that something awful has happened or will happen

B: I wonder whether this is some kind of premonition

C: This is a weird, but common experience

11. Imagine you get turned down to go out by someone you like or a friend.

I am most likely to think: (please circle A, B, or C)

A: I quite often get rejected in this situation

B: You win some, you lose some

C: I always get rejected for anything I try

12. Imagine that one day you enter a shop and you hear people laughing.

I am most likely to think: (please circle A, B, or C)

A: They must be laughing at me

B: I wonder if they are laughing at me

C: The laughing is probably nothing to do with me

13. Imagine there are police cars outside your house. You suddenly realise you feel uncomfortable.

I am most likely to think: (please circle A, B, or C)

A: Funny how just seeing the police has this unsettling effect on people

B: I wonder why I feel so uncomfortable, could the cars be something to do with me

C: I must have done something wrong to feel so uncomfortable, they've come to get me

14. Imagine you are watching television, and suddenly the screen goes blank.

I am most likely to think: (please circle A, B, or C)

A: Weird things are always happening

B: This sort of thing seems to happen quite a lot

C: There must be something wrong with the TV today

15. Imagine two people in a queue at a supermarket both look your way at the same time and then immediately start to talk to each other.

I am most likely to think: (please circle A, B, or C)

A: This is not the first time this has happened

B: This sort of thing can happen in queues

C: This always happens wherever I go

16. Imagine you are waiting in a café for an acquaintance to arrive, and you suddenly feel a strange shivery feeling inside.

I am most likely to think: (please circle A, B, or C)

A: Feeling shivery is a bad omen, I don't think I should meet this person

B: I must be nervous about meeting this person

C: I wonder if feeling shivery means something bad might happen

17. Imagine you think you see a shadowy figure moving across the wall of an empty room.

I am most likely to think: (please circle A, B, or C)

A: I wonder what that was

B: My eyes must be playing tricks on me

C: There must have been someone or something there

18. Imagine that the phone rings. When you answer, the other party hangs up.

I am most likely to think: (please circle A, B, or C)

A: I wonder if there's something suspicious about this

B: Somebody is definitely checking up on me

C: Someone's probably got the wrong number

19. Imagine you are watching the news on TV about a recent disaster and you find yourself feeling guilty.

I am most likely to think: (please circle A, B, or C)

A: If I feel guilty I must be responsible in some way

B: It's normal to feel guilty when a disaster has happened to someone else

C: I wonder why I feel guilty, maybe I'm unwittingly responsible in some way

20. Imagine you are listening to the radio and suddenly there is crackling interference.
I am most likely to think: (please circle A, B, or C)
A: Someone has deliberately tampered with my radio so that it is no longer tuned properly
B: I wonder if someone has been fiddling with my radio
C: There is some sort of interference on the radio waves

21. Imagine that you are sitting on a train, and you think you can hear two people behind you talking about you. When you look round they are reading their papers and not talking to each other.
I am most likely to think: (please circle A, B, or C)
A: They were definitely talking about me, they're just pretending to be reading their paper
B: I'm sure I heard them talking about me, maybe I was wrong
C: I should find out if anyone else ever has this kind of experience before deciding what really happened

22. Imagine you are at home; everything is quiet when you hear a sudden fast banging on the walls.
I am most likely to think: (please circle A, B, or C)
A: The neighbours are doing this deliberately to upset me
B: The neighbours could be doing some kind of home improvements
C: The neighbours might be trying to tell me something
23. Imagine you a reading a newspaper or magazine, and you read an article which has some special relevance to you.
I am most likely to think: (please circle A, B, or C)
A: This article seems to have been written with people like me in mind
B: I wonder if someone may have written this article for me
C: Someone has definitely written this article for me specifically

24. Imagine you notice that a person you don't know is looking at you.
You suddenly find yourself feeling unsettled.
I am most likely to think: (please circle A, B, or C)
A: Feeling this unsettled means this person intends to do me harm

B: I wonder why I feel this unsettled, could this mean this person is thinking bad things about me

C: Being looked at can make people feel unsettled, I don't worry about it

25. Imagine that one evening you are sitting at home alone when a door suddenly slams by itself in another room.

I am most likely to think: (please circle A, B, or C)

A: Someone or something must have got into the house

B: I wonder if somebody or something's there

C: It's probably a draught

26. Imagine someone you know calls you just as you were thinking about them. As you pick up the phone you suddenly realise you are feeling upset.

I am most likely to think: (please circle A, B, or C)

A: It's odd that I should feel upset, but I don't read too much into it

B: I wonder why I feel upset, could there be something peculiar about this call

C: Feeling upset means something, it must be bad news

27. Imagine you are walking down the road when you suddenly notice a careers poster which seems to stand out from your surroundings.

I am most likely to think: (please circle A, B, or C)

A: I wonder why my eyes seem so drawn to that poster

B: Maybe I'm noticing it because my career isn't such a success

C: It's a sign that my life is such a failure

28. Imagine you are on a bus; the driver keeps stopping abruptly, so that you stumble each time.

I am most likely to think: (please circle A, B, or C)

A: I wonder if he's doing it on purpose to wind people up

B: This bus driver can't drive properly

C: He's doing it on purpose to humiliate me

29. Imagine you hear that a friend is having a party and you have not been invited.

I am most likely to think: (please circle A, B, or C)

A: I wonder if they don't like me as much as I thought they did

B: Perhaps I can try to find out a bit more about the situation before making any assumptions

C: They obviously don't like me

30. Imagine you are dozing on the sofa in front of the TV and you suddenly wake up startled.

I am most likely to think: (please circle A, B, or C)

A: I tend to always wake up startled when I'm dozing

B: The TV must have woken me

C: I can never get any sleep

Thank you for taking the time to complete the questionnaire.

Scoring

The questionnaire consists of 30 statements, covering 2 separate themes of vignettes: 15 relating to *AP* and 15 relating to *TE*. Each group of statements covers 5 cognitive biases: *intentionalising*; *catastrophising; dichotomous thinking; jumping to conclusions*; and *emotional reasoning*. There are 3 statements per bias for each theme, ie, 6 statements per bias in total. The statements and responses are randomly listed. Each statement is rated on a 3-point scale ranging from 1 to 3

(1 = absence of bias; 2 = presence of bias with some qualification; and 3 = presence of bias). The maximum total score for each theme is 45, with a total overall score of 90.

1. TE/I A = 3 B = 2 C = 1	2. AP/C A = 2 B = 3 C = 1	3. AP/I A = 2 B = 1 C = 3	4. TE/C A =1 B = 2 C = 3
5. TE/DT A = 3 B = 2 C = 1	6. AP/JTC A = 2 B = 1 C = 3	7. TE/C A = 2 B = 3 C = 1	8. AP/ER A = 2 B = 3 C = 1
9. TE/JTC A = 1 B = 2 C = 3	10. AP/C A = 3 B = 2 C = 1	11. TE/DT A = 2 B = 1 C = 3	12. TE/C A = 3 B = 2 C = 1
13. TE/ER A =1 B = 2 C = 3	14. AP/DT A = 3 B = 2 C = 1	15. TE/DT A = 2 B = 1 C = 3	16. AP/ER A = 3 B = 1 C = 2

17. AP/JTC A = 2 B = 1 C = 3	18. TE/JTC A = 2 B = 3 C = 1	19. TE/ER A = 3 B = 1 C = 2	20. AP/I A = 3 B = 2 C = 1
21. AP/JTC A = 3 B = 2 C = 1	22. TE/I A = 3 B = 1 C = 2	23. AP/I A =1 B = 2 C = 3	24. TE/ER A = 3 B = 2 C = 1
25. AP/C A = 3 B = 2 C = 1	26. AP/ER A =1 B = 2 C = 3	27. AP/DT A =1 B = 2 C = 3	28. TE/I A = 2 B = 1 C = 3
29. TE/JTC A = 2 B = 1 C = 3	30. AP/DT A = 2 B = 1 C = 3	--	--

Key: TE, threatening event; AP, anomalous perception; I, intentionalising; C, catastrophising; DT, dichotomous thinking; JTC, jumping to conclusions; ER, emotional reasoning.

Hypomania Interpretations Questionnaire (HIQ-10, Jones et al., 2006)

Listed below are situations that you may or may not have ever experienced. For each situation, please circle the letter next to each reason that corresponds to how much that might explain the situation for you. Please check every item for each question. Also, answer whether you have experienced the situation in the last 3months by circling A(yes) or B (no). Please answer all questions.

	A	B	C	D
	Not at all	Somewhat	Quite a bit	A great deal
1. If I thought my thoughts were going too fast I would probably think it was because:				
I am intelligent and full of good ideas.	A	B	C	D
There are too many competing tasks for me at present.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
2. If I was on the go so much that other people couldn't keep up with me, I would probably think it was because:				
I am overdoing it and will soon need a rest.	A	B	C	D
I have more stamina than other people.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
3. If my thoughts were coming so thick and fast that other people couldn't keep up, I would probably think it was because:				
I am full of good ideas and others are too slow.	A	B	C	D
There are too many demands on my time.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
4. If I was feeling 'sped up' inside, I would probably think it was because:				
I am under pressure from work or social demands.	A	B	C	D

I am in good spirits and can take on challenges.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
5. If I felt physically restless and kept moving from one activity to the next, I would probably think it was because:				
I am full of energy and raring to go.	A	B	C	D
There is too much pressure and I need a break.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
6. If I felt impulsive, I would probably think it was because:				
I could make rapid decisions and good choices.	A	B	C	D
There are lots of external demands.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
7. If I felt in high spirits and full of energy, I would probably think it was because:				
I am a talented person with lots to offer.	A	B	C	D
Things happen to be going well for me at present.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
8. If I woke up earlier than normal and felt full of energy, I would probably think it was because:				
I am a happy, positive and energetic person.	A	B	C	D
Something has disrupted my routine.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no
9. If I found my thinking was very quick and clear, I would probably think it was because:				
There are few distractions at present.	A	B	C	D
I am clever and talented.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no

10. If I found that tastes, smells or things I touched seemed more vivid, I would probably think it was because:				
It is just a phase and will pass.	A	B	C	D
I am more sensitive and 'tuned in' than other people.	A	B	C	D
Have you experienced this situation in the last 3 months?			A_yes	B_no

Altman Mania Rating Scale (AMRS; Altman et al. 1997).

The Altman Self-Rating Mania Scale is a short, 5-item self-assessment questionnaire that can be helpful in assessing the presence and severity of manic or hypomanic symptoms. Because this scale is compatible with the CARS-M, YMRS, and DSM-IV diagnostic criteria, it can be used effectively as a screening and diagnostic instrument despite its brevity.

There are 5 groups of statements in this questionnaire, read each group of statements carefully. You should choose the statement in each group that best describes the way you have been feeling for the past week.

Please note: The word "occasionally" when used here means once or twice; "often" means several times or more and "frequently" means most of the time.

Positive Mood

0 - I do not feel happier or more cheerful than usual.

1 - I occasionally feel happier or more cheerful than usual.

2 - I often feel happier or more cheerful than usual.

3 - I feel happier or more cheerful than usual most of the time.

4 - I feel happier or more cheerful than usual all of the time.

Self-Confidence

0 - I do not feel more self-confident than usual.

1 - I occasionally feel more self-confident than usual.

2 - I often feel more self-confident than usual.

3 - I feel more self-confident than usual.

4 - I feel extremely self-confident all of the time.

Sleep Patterns

0 - I do not need less sleep than usual.

1 - I occasionally need less sleep than usual.

2 - I often need less sleep than usual.

3 - I frequently need less sleep than usual.

4 - I can go all day and night without any sleep and still not feel tired.

Speech

0 - I do not talk more than usual.

1 - I occasionally talk more than usual.

2 - I often talk more than usual.

3 - I frequently talk more than usual.

4 – I talk constantly and cannot be interrupted.

Activity Level

0 - I have not been more active (either socially, sexually, at work, home or school) than usual.

1 - I have occasionally been more active than usual.

2 - I have often been more active than usual.

3 - I have frequently been more active than usual.

4 - I am constantly active or on the go all the time.